

PSP Cover Sheet

Proposal Title: Science-Based Adaptive Management of the Lower American River
 Applicant Name: Water Forum (as administered by the City of Sacramento)
 Contact Name: Jonas Minton, Executive Director
 Mailing Address: 660 J Street, Suite 260, Sacramento, CA 95814
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Amount of funding requested: Total \$1.59 million for a three (3) year period

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost _____

Federal cost _____

Cost share partners?

☒ Yes ☐ No

Identify partners and amount contributed by each: Water Forum (from the Habitat Management Element of the Water Forum Agreement) - \$1.0 million and the Sacramento Area Flood Control Agency (SAFCA) - \$5.6 million

Indicate the Topic for which you are applying (check only one box).

- | | |
|--|---|
| <input type="checkbox"/> Natural Flow Regimes | <input type="checkbox"/> Beyond the Riparian Corridor |
| <input type="checkbox"/> Nonnative Invasive Species | <input checked="" type="checkbox"/> Local Watershed Stewardship |
| <input type="checkbox"/> Channel Dynamics/Sediment Transport | <input type="checkbox"/> Environmental Education |
| <input type="checkbox"/> Flood Management | <input type="checkbox"/> Special Status Species Surveys and Studies |
| <input type="checkbox"/> Shallow Water Tidal/ Marsh Habitat Research | <input type="checkbox"/> Fishery Monitoring, Assessment and |
| <input type="checkbox"/> Contaminants | <input type="checkbox"/> Fish Screens |

What county or counties is the project located in? Sacramento County

What CALFED ecozone is the project located in? See attached list and indicate number. Be as specific as possible: CALFED ecozone 9.2, Lower American River

Indicate the type of applicant (check only one box):

- | | |
|---|---|
| <input type="checkbox"/> State agency | <input type="checkbox"/> Federal agency |
| <input type="checkbox"/> Public/Non-profit joint venture, | <input type="checkbox"/> Non-profit |
| <input checked="" type="checkbox"/> Local government/district | <input type="checkbox"/> Tribes |
| <input type="checkbox"/> University | <input type="checkbox"/> Private party |
| <input type="checkbox"/> Other: | |

Indicate the primary species which the proposal addresses (check all that apply):

- | | |
|--|---|
| <input type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon | <input type="checkbox"/> Spring-run chinook salmon |
| <input type="checkbox"/> Winter-run chinook salmon | <input checked="" type="checkbox"/> Fall-run chinook salmon |
| <input type="checkbox"/> Late-fall run chinook salmon | <input type="checkbox"/> Longfin smelt |
| <input type="checkbox"/> Delta smelt | <input checked="" type="checkbox"/> Steelhead trout |
| <input checked="" type="checkbox"/> Splittail | <input type="checkbox"/> Striped bass |
| <input type="checkbox"/> Green sturgeon | <input type="checkbox"/> All chinook species |
| <input type="checkbox"/> White Sturgeon | <input type="checkbox"/> All anadromous salmonids |
| <input type="checkbox"/> Waterfowl and Shorebirds | <input type="checkbox"/> American shad |
| <input type="checkbox"/> Migratory birds | |
| <input type="checkbox"/> Other listed T/E species: | |

Indicate the type of project (check **only** one box):

- | | |
|--|--|
| <input type="checkbox"/> Research/Monitoring | <input checked="" type="checkbox"/> Watershed Planning |
| <input type="checkbox"/> Pilot/Demo Project | <input type="checkbox"/> Education |
| <input type="checkbox"/> Full-scale Implementation | |

Is this a next-phase of an ongoing project?

Yes X No

Have you received funding from CALFED before?

Yes X No

If yes, list project title and CALFED number: Development of a River Corridor Management Plan for the Lower American River. 99-N21

Have you received funding from CVPIA before?

Yes No X

If yes, list CVPIA program providing funding, project title and CWIA number (if applicable):

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Jonas Minton. Executive Director. Water Forum

Printed name of applicant



Signature of applicant

EXECUTIVE SUMMARY

Next Phase Funding: SCIENCE-BASED ADAPTIVE MANAGEMENT OF THE LOWER AMERICAN RIVER

Amount Requested: \$1,590,000 cost share for a three year project
Applicant Name: Water Forum (as administered through the City of Sacramento)
Primary Contact: Jonas Minton, Executive Director
Address: Water Forum, 660 J Street, Suite 260, Sacramento, CA 95814
Telephone/FAX: 916-264-1998/916-264-5286
E-mail: jminton@cityofsacramento.org

Participants & Collaborators: The sponsoring agencies are the Water Forum (comprised of 40 stakeholder organizations including business and agricultural leaders, environmentalists, citizen groups, water managers, and local governments) and the Sacramento Area Flood Control Agency. Sponsoring agencies will be contributing \$6,600,000 for the three-year project. Collaborators include the California Department of Fish & Game and the American River FISH Group and Technical Subcommittee consisting of: CALFED (Terry Mills); National Marine Fisheries Service (Dennis Smith); U.S. Fish and Wildlife Service (Rich DeHaven, Craig Fleming, and Andy Hamilton); CA Fish and Game (Bill Snider); U.S. Army Corps of Engineers (Matt Davis); U.S. Bureau of Reclamation (David Robinson and Rod Hall); and Save the American River Association (Felix Smith).

This is the next phase of state-of-the-art Science Based Adaptive Management of the Lower American River. In the first year, CALFED funds are contributing to the development of a Multi-Agency River Corridor Management Plan (RCMP) that will include a fisheries and aquatic habitat element (FISH Plan) designed to achieve the goals of CALFED's Ecosystem Restoration Program for the LAR and other relevant restoration programs.

A set of key hypotheses of the RCMP are that improved temperature, flow and physical habitat conditions will result in increased populations of the target species (steelhead, fall-run salmon and sacramento splittail) and other fish species of concern in the LAR. Toward this end, several projects are being implemented including: modifications to the temperature control shutters at Folsom Dam to improve management of the reservoir's coldwater pool, establishment of a new flow standard for the LAR, enhancement of floodplain habitat in the LAR to provide increased opportunities for splittail spawning and rearing, and management and maintenance of shaded riverine aquatic habitat covering over two miles of riverbank in the leveed portion of the river.

Next phase CALFED funding is needed rigorously test the hypotheses underlying these projects. This funding will be used in part to permit CDFG, in cooperation with the FISH Technical Subcommittee, to develop a state-of-the-art monitoring program incorporating appropriate metrics, monitoring protocols and updated population census techniques. The monitoring program will be carried out with CALFED funding over a three-year period by CDFG personnel, subject to such refinements and adaptations as may be recommended by the Technical Subcommittee.

The methodology and results of this science-based adaptive management approach will also be available to assist recovery of at-risk species, rehabilitation of natural processes, and restoration of functional habitat in other CALFED Ecological Management Zones in the Bay-Delta watershed. (ERP Goals 1, 2 and 4).

Statement of the Problem

The LAR provides important habitat for several at-risk fish species (target species), including the fall-run chinook salmon, steelhead, and Sacramento splittail that strongly affect the operation of the State Water Project and the Central Valley Project diversions in the south Delta. Important aquatic habitats include gravel spawning beds for chinook salmon and steelhead, primarily in the upper portion of the LAR, and low gradient rearing habitat including sloughs, side channels, and shaded riverine aquatic (SRA) habitat, as well as floodplain habitat for splittail spawning.

Historic alteration and on-going management of the LAR ecosystem have resulted in a number of stressors to the habitat of these at-risk fish species. The most important stressors include altered streamflows, water temperatures, sediment supply, and floodplain and stream channel processes; competition and predation from non-native fish species; and invasive riparian plant species. Concerns include low base flows for spawning and rearing of salmon and steelhead, as well as flow fluctuations that can dewater spawning redds and strand fry and juvenile fish. The natural sediment supply in the LAR has been interrupted by historical hydraulic gold and gravel mining?dams, levees, and bank protection. Levee construction, bank protection, mining, and channel incisions have greatly altered the geomorphology of the floodplain. The RCMP goal is to substantially reduce these stressors.

In January 200 CALFED funding was secured to create a Multi-Agency River Corridor Management Plan (RCMP), including a Fisheries and Aquatic Habitat Management Element (FISH Plan), aimed at substantially reducing these stressors. The RCMP is currently building upon the accomplishments of broadly based efforts to manage the river for multiple beneficial uses, including those undertaken by CDFG, FOR, Water Forum, the LAR Task Force (the River Corridor Steering Committee referenced in the original proposal), and previous LAR Technical Committee workshops. The RCMP includes two primary components: (1) development of scientific consensus among biologists, resource managers, and technical experts concerning the critical needs of aquatic species on the LAR and the priorities for recovery actions and, (2) a comprehensive coordination of habitat restoration and management efforts among local, state, and federal agencies and stakeholder groups.

The fish species chosen as the focus of the FISH Plan are fall-run chinook salmon, steelhead, and splittail (target species). These target species were chosen to comply with applicable laws, in particular, the Endangered Species Act (ESA) and California Endangered Species Act (CESA), and to be consistent with state and federal restoration plans, as described in the following documents: CALFED's Ecosystem Restoration Program Plan, 1999, which identifies programmatic actions to protect splittail, fall-run chinook salmon, and steelhead; U.S. Fish and Wildlife Service's Draft Restoration Plan for the Anadromous Fish Restoration Program, 1997, which identifies specific actions on the American River to protect salmonids; CDFG's Steelhead Restoration and Management Plan for California, 1996, which identifies specific actions on the American River to protect steelhead; and, CDFG's Restoring Central Valley Streams, A Plan for Action, 1993, which identifies specific actions on the American River to protect salmonids. Improving LAR conditions for target species also will improve conditions for American shad and striped bass, and other native resident aquatic and terrestrial species.

The fish population-monitoring project was selected based on the need for systematic monitoring to test the hypotheses for the FISH Plan projects. CDFG fish monitoring to support these projects requires staff, equipment, and refinement of monitoring methods especially for steelhead, and splittail.

A key hypothesis of the FISH Plan is that improved temperature, flow, and physical habitat conditions in the LAR will result in increased populations of the target species in the river. Toward this end, several projects have been developed for early implementation as part of the RCMP that would improve management of the coldwater pool in Folsom Reservoir, establish a new flow standard for the LAR, enhance floodplain habitat in the lower three miles of the river, and increase the extent of shaded riverine aquatic habitat along the river's edge.

CDFG is responsible for monitoring fish population trends in the LAR. Relatively good data are available on adult escapement; however, data on natural spawning production and juvenile survival, key indices of the impact of identified stressors in the river, is unreliable. CALFED funding is needed to enhance CDFG's monitoring efforts in these areas so as to systematically measure the responsiveness of the target fish populations to the RCMP early implementation projects.

Specific conceptual models were prepared to describe the understanding of ecosystem processes that forms the foundation for the restoration work to be proposed in the FISH Plan (Figures 1 through 5). These models present the desired habitat characteristics by lifestages for the species of primary management concern, and the existing environmental stressors.

Additionally, conceptual models and testable hypotheses were prepared for four restoration projects that are currently underway (Figures 6 through 9) to present the framework for how ecosystem processes, stressors, restoration needs, monitoring, and adaptive management will be incorporated into the planning and design of FISH Plan projects once they are identified. (No CALFED funding is requested for these four projects.)

For example, the project described in Figure 8, improving floodplain habitat in the LAR, sharply demonstrates the limitations of evaluating projects without accurate fish population counts. Not only the success of the *project objective* (e.g., protect and restore channel-floodplain connectivity), but also the success in achieving the *desired outcome* (e.g., achieve and maintain a viable population of splittail), needs to be measured. Currently, the success of the project in restoring channel-floodplain connectivity can be evaluated, but not progress toward the ultimate goal of maintaining a viable population of splittail. Adequate measurement of the *desired outcome* cannot occur for any of these projects without an enhanced fish population monitoring program which would allow accurate assessments of the effects of these projects on the fish population.

The source of the habitat characteristics and stressors information contained in the models include the CDFG, USFWS and CALFED documents referenced above, as well as numerous research papers. With respect to relative uncertainties present in the models, uncertainties exist with respect to the relative importance of each habitat characteristic or associated stressors in impacting the health of individual fish or fish populations. These uncertainties will be narrowed as restoration actions are implemented, monitored, and evaluated.

The proposed fish population-monitoring project, which will serve as the foundation for the FISH Plan monitoring program, has been preliminarily developed. The lifecycles of fall-run chinook salmon, steelhead, and splittail are presented on Figures 10 through 12 with the proposed monitoring identified for specific lifestages. The fish population monitoring project will begin immediately so that a baseline is established before project implementation begins.

Figure 1'. Conceptual Model of Lower American River Ecosystem Processes for Fall-Run Chinook Salmon and Steelhead Spawning and Incubation

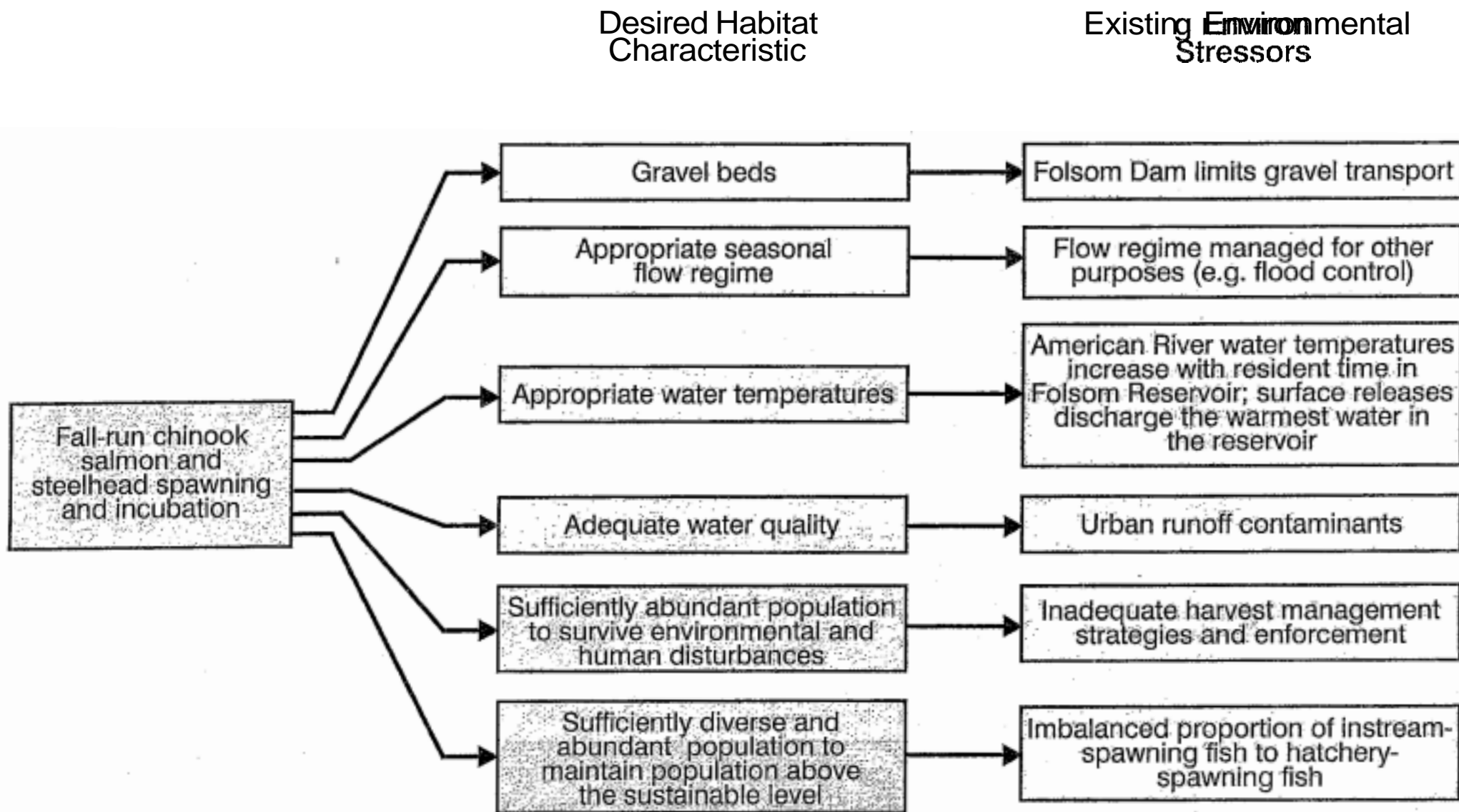


Figure 2. Conceptual Model of Lower American River Ecosystem Processes for Fall-Run Chinook Salmon and Steelhead Rearing

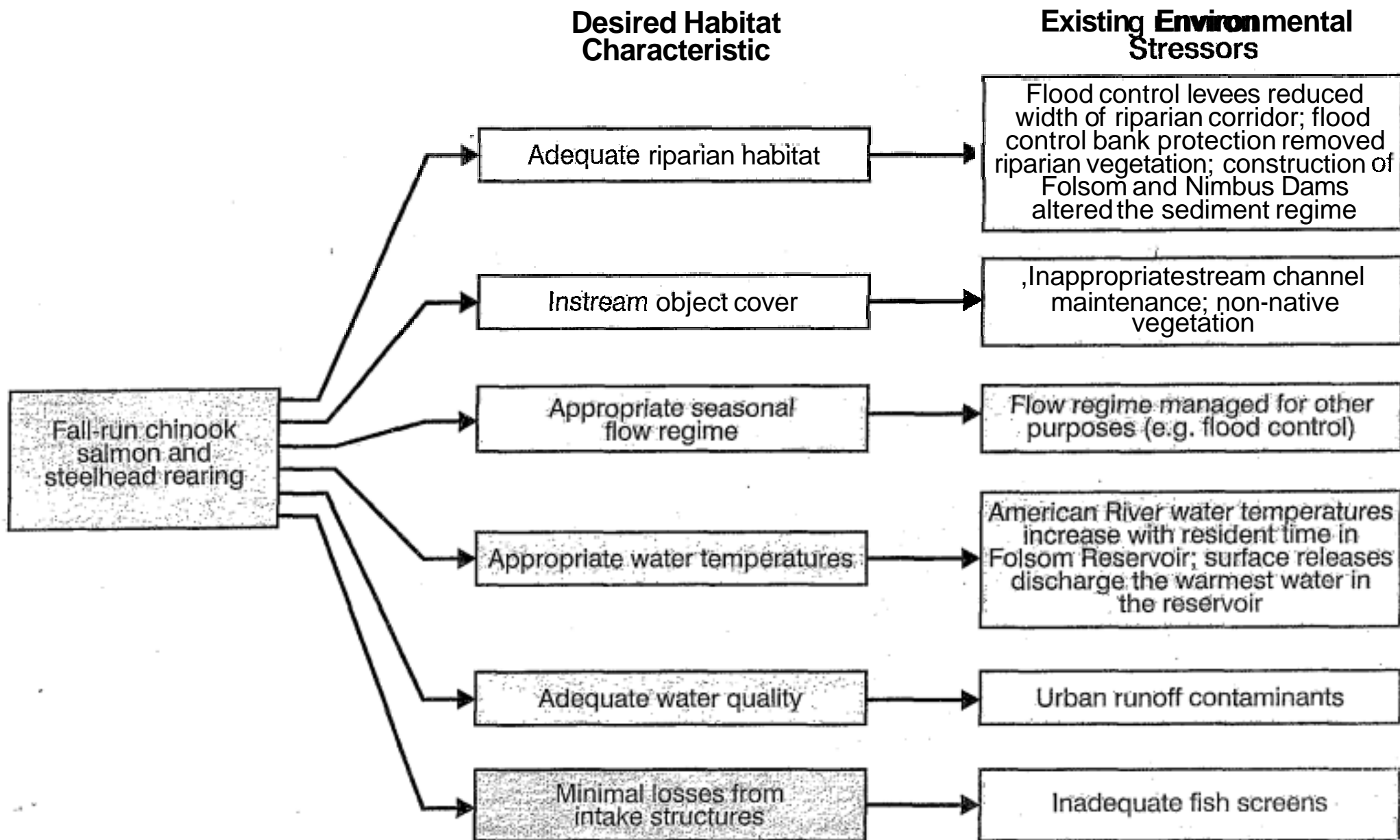


Figure 3. Conceptual Model of Lower American River Ecosystem Processes for Fall-Run Chinook Salmon and Steelhead Juvenile Outmigration

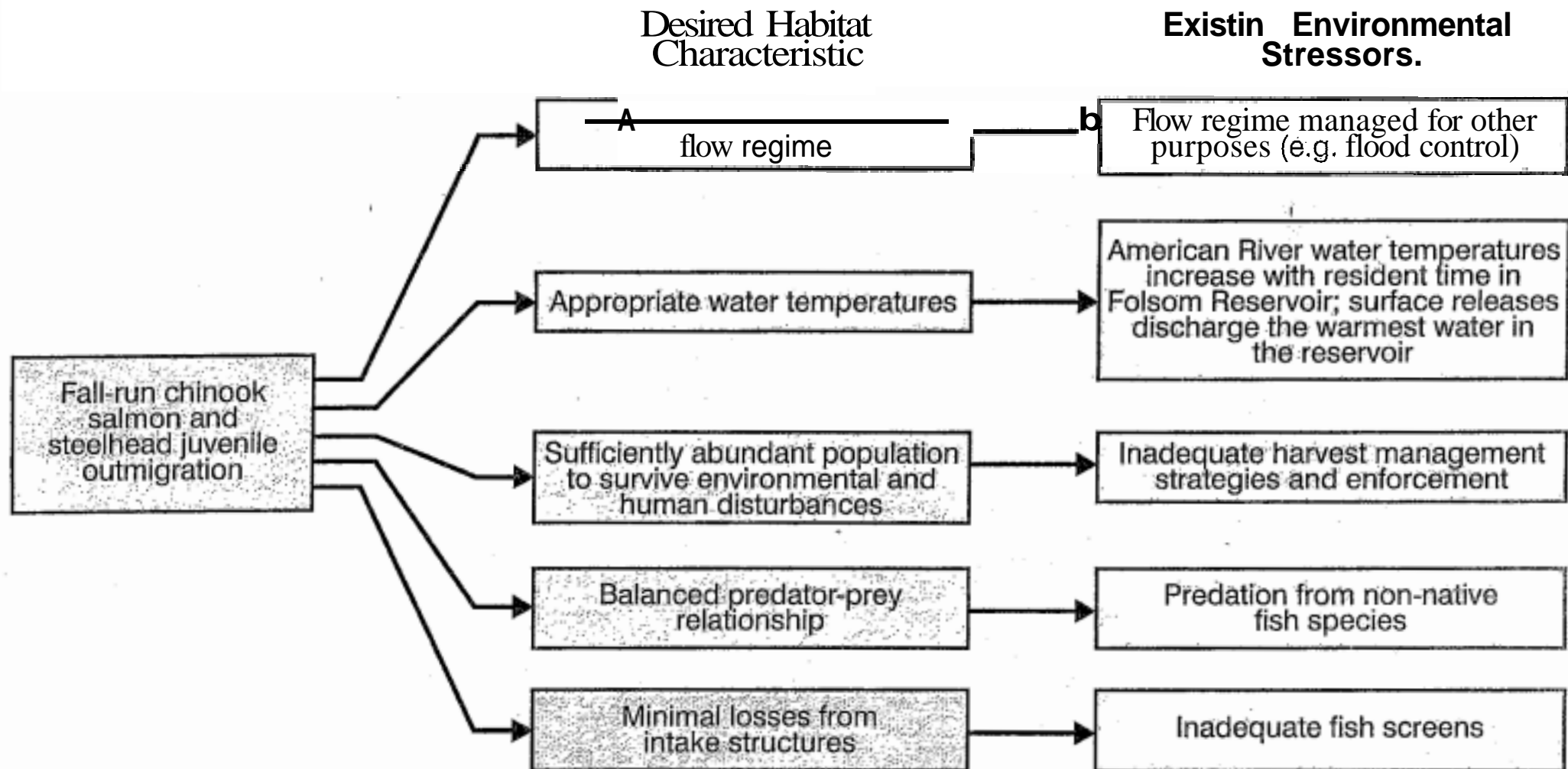


Figure 4. Conceptual Model of Lower American River Ecosystem Processes for Fall-Run Chinook Salmon and Steelhead Adult Upstream Migration

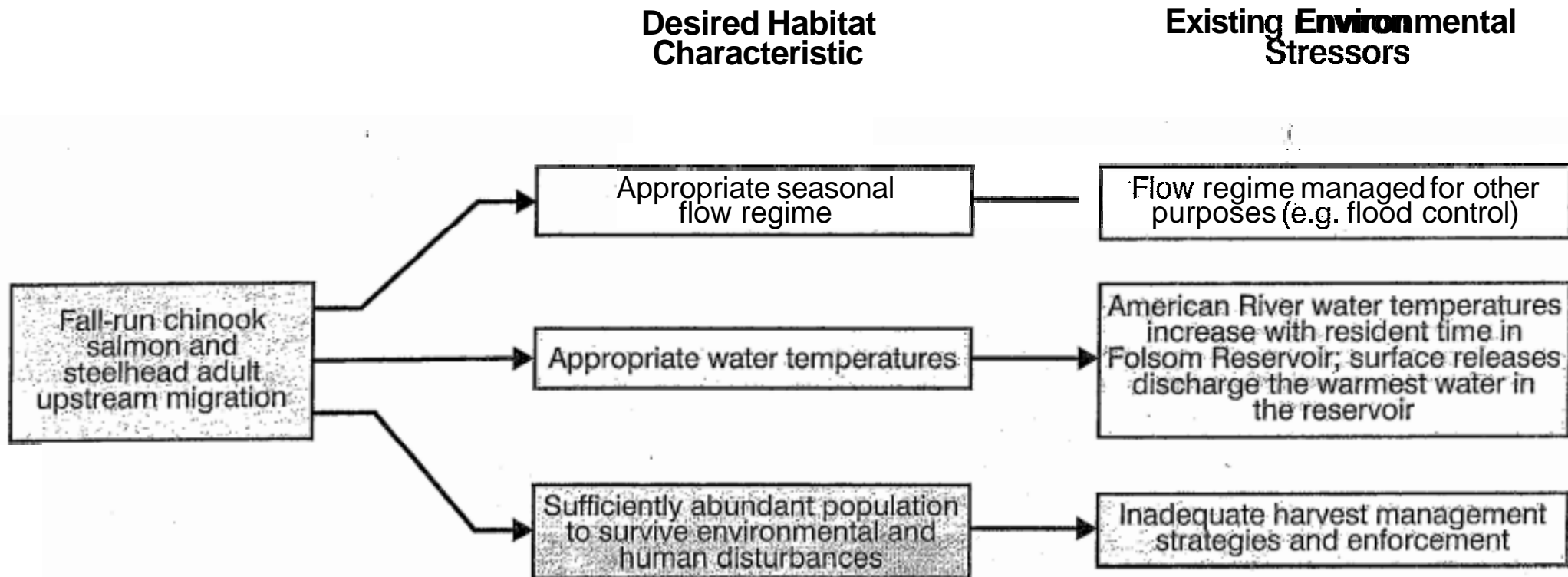


Figure 5. Conceptual Model of Lower American River Ecosystem Processes for Splittail Spawning and Rearing

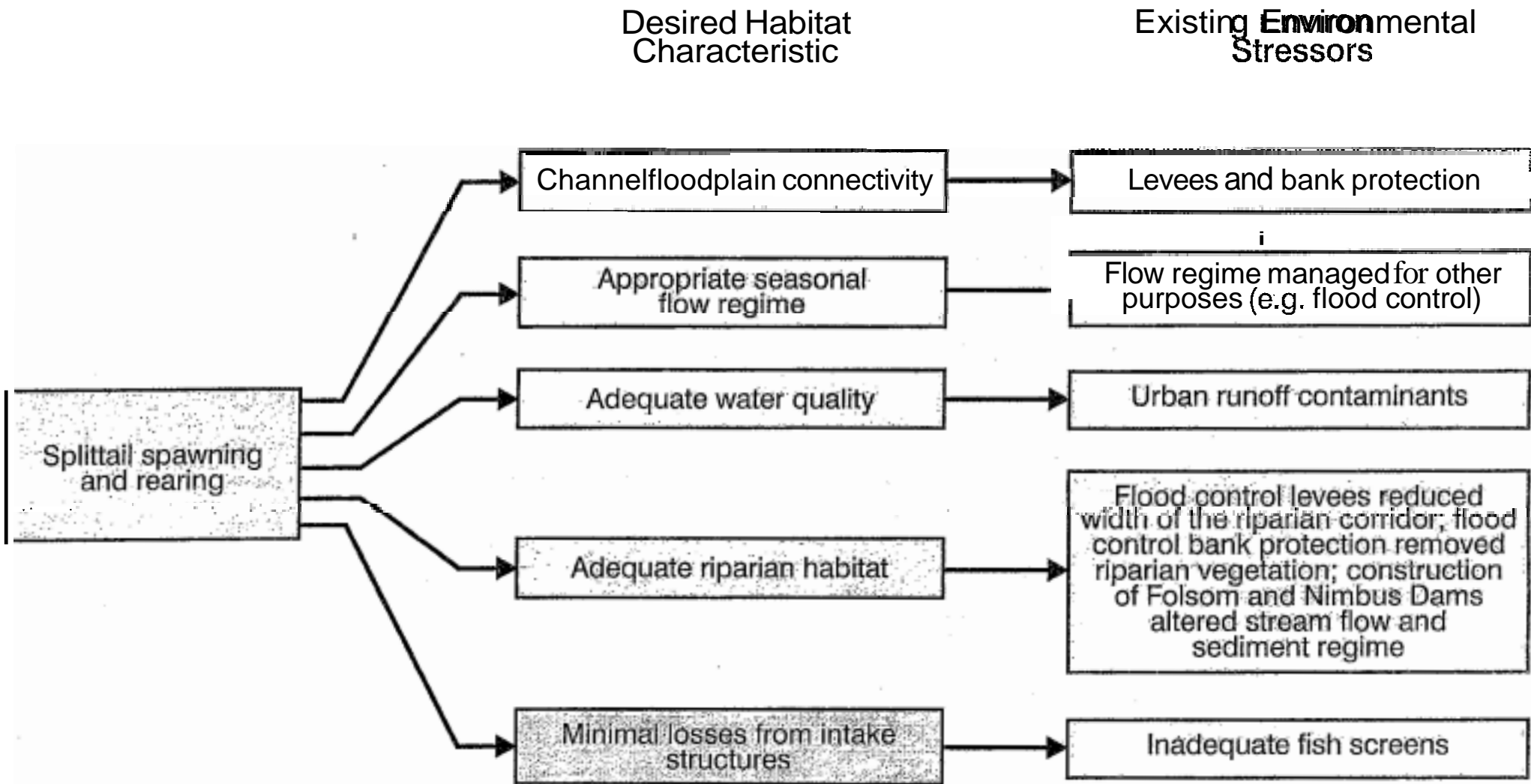


Figure 6. Conceptual Model and Hypothesis for RCMP Project - Modify Temperature Control Shutters at Folsom Dam

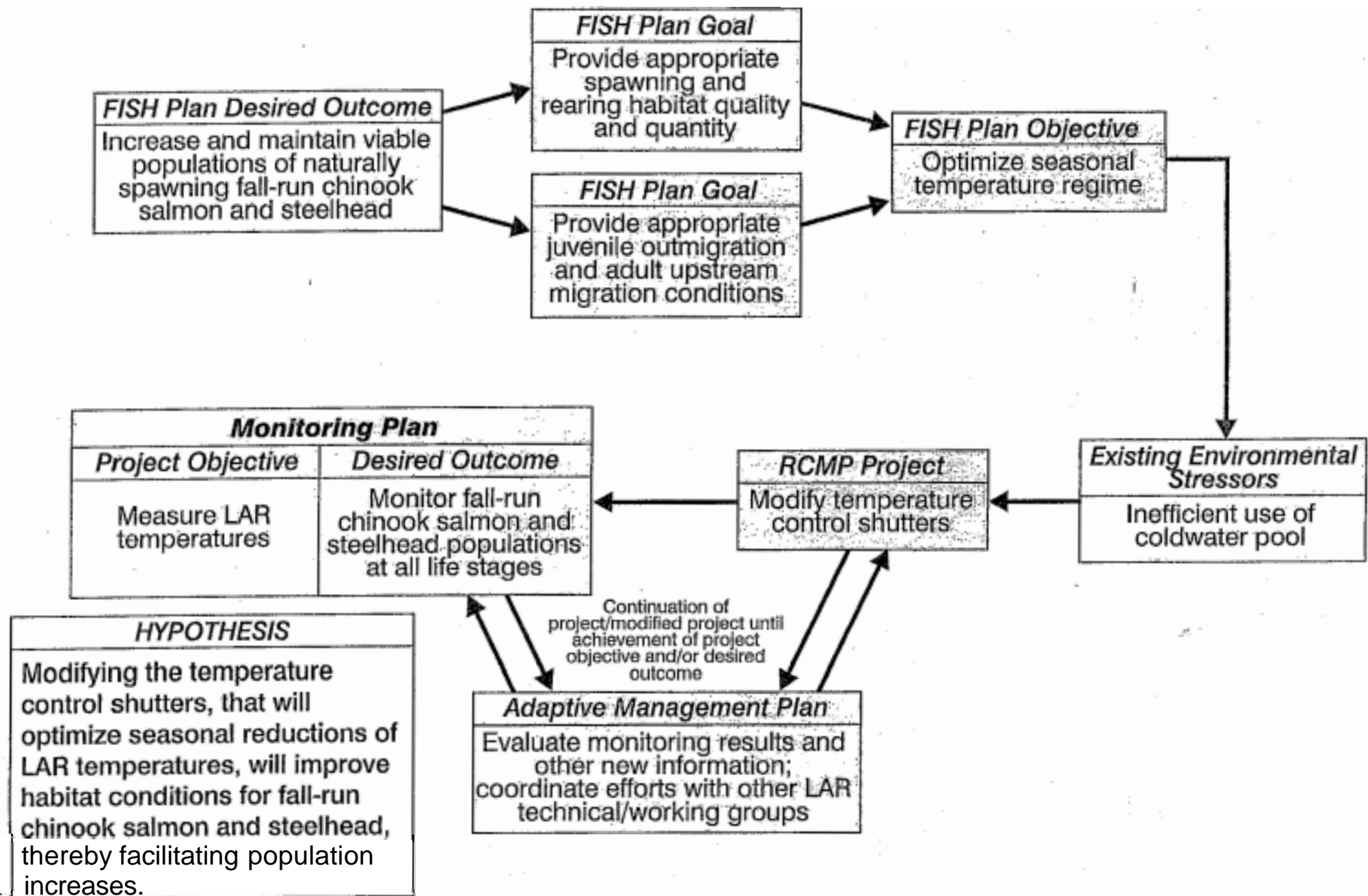


Figure 7. Conceptual Model and Hypothesis for RCMP Project - Update LAR Flow Standard

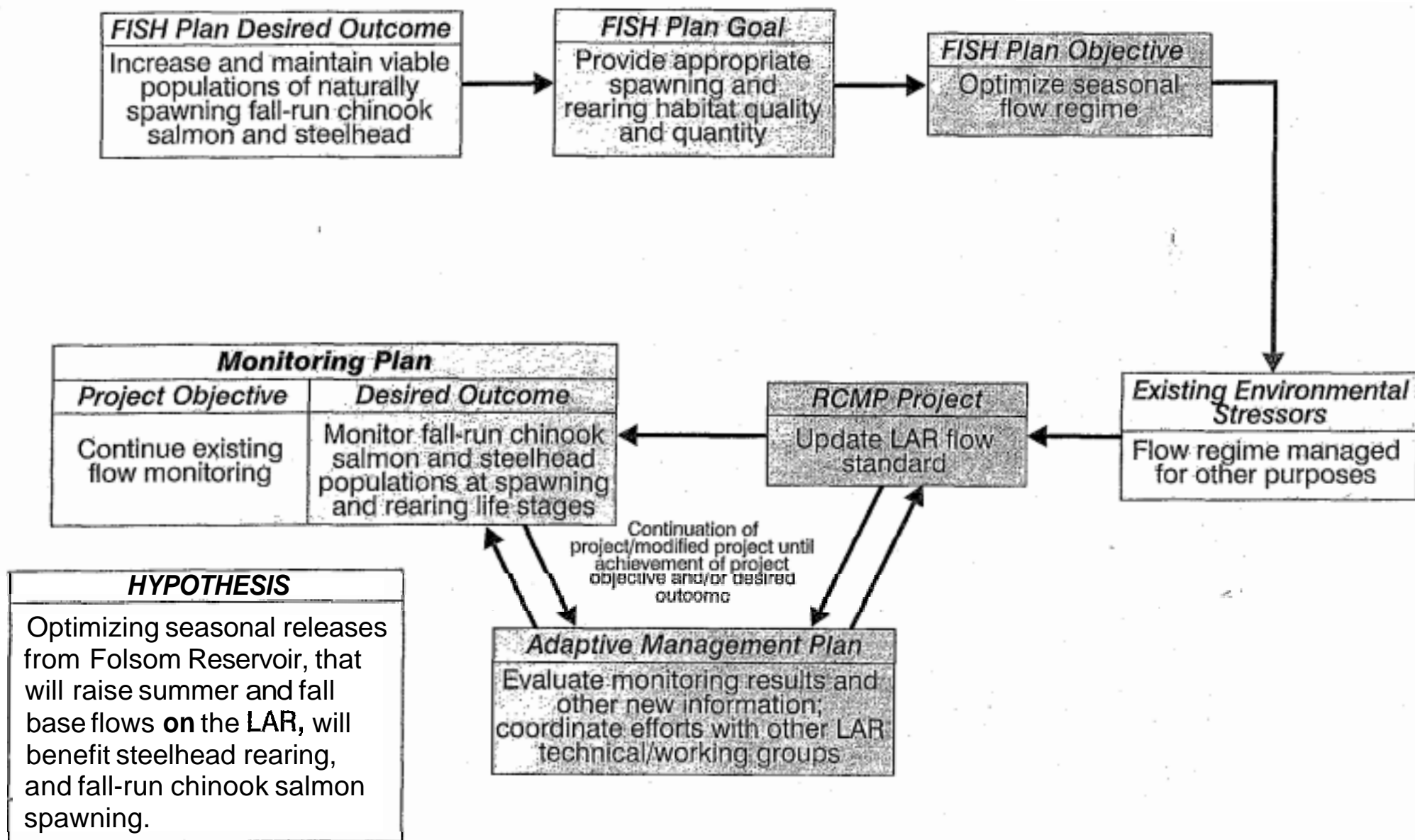


Figure 8. Conceptual Model and Hypothesis for RCMP Project - Improve Floodplain Habitat in the LAR Corridor

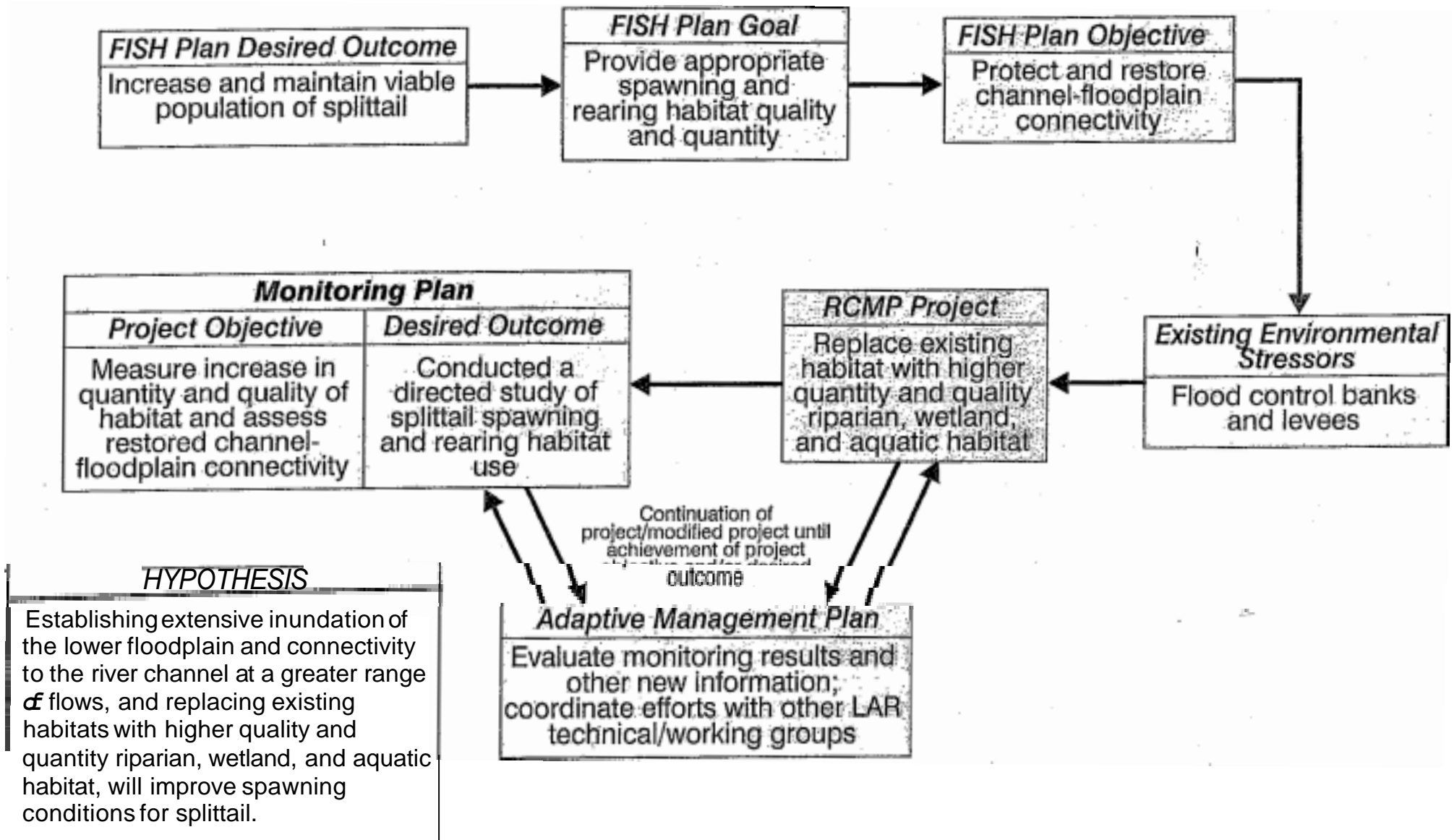
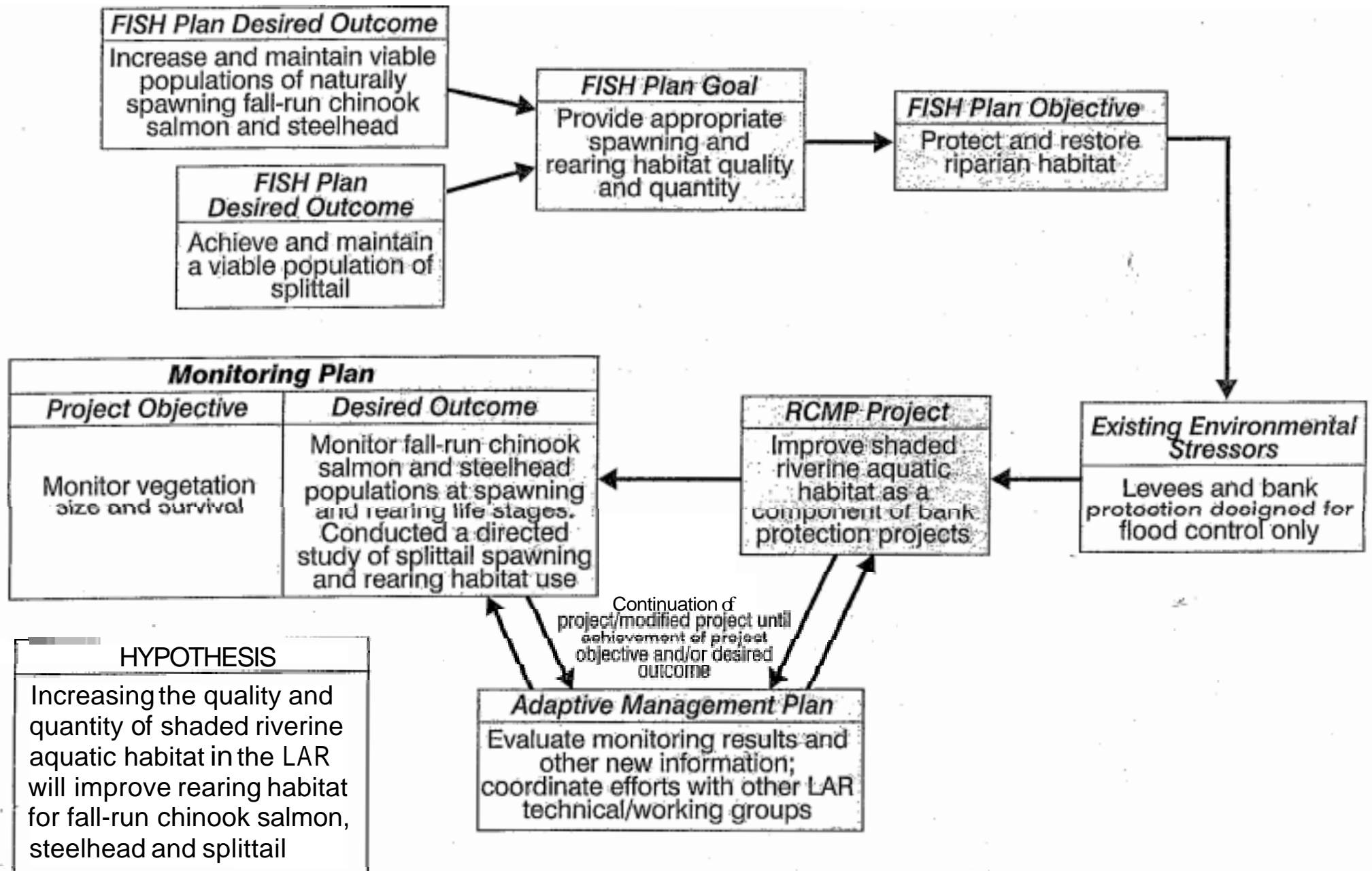


Figure 9. Conceptual Model and Hypothesis for **RCMP** Project - Improve Shaded, Riverine Aquatic Habitat in the LAR



Chinook Salmon Life Cycle

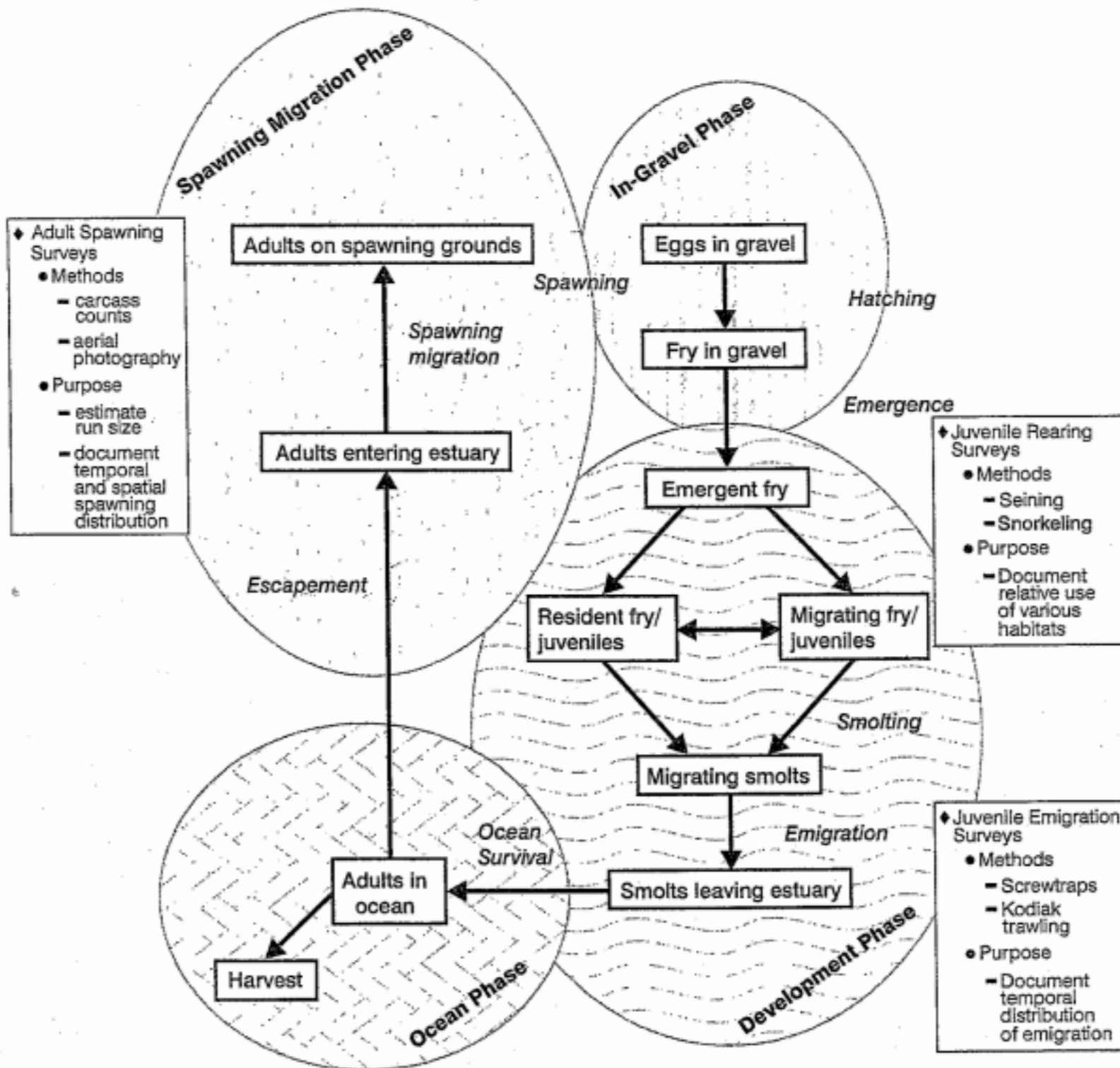


Figure 10. Chinook Salmon Lifecycle with Fish Population Monitoring Plan

Figure 1 ■ Steelhead Trout Lifecycle with Fish Population Monitoring Plan

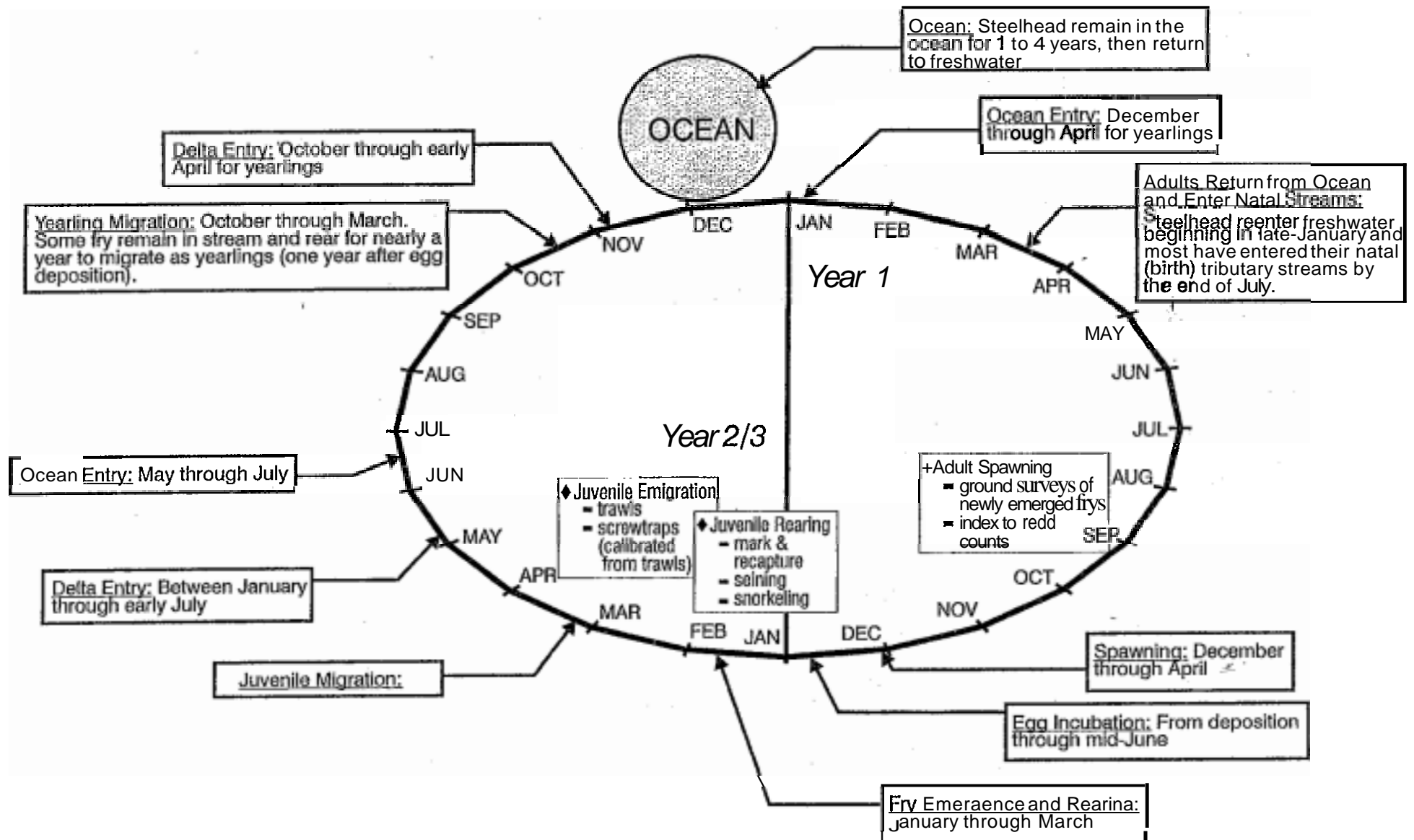
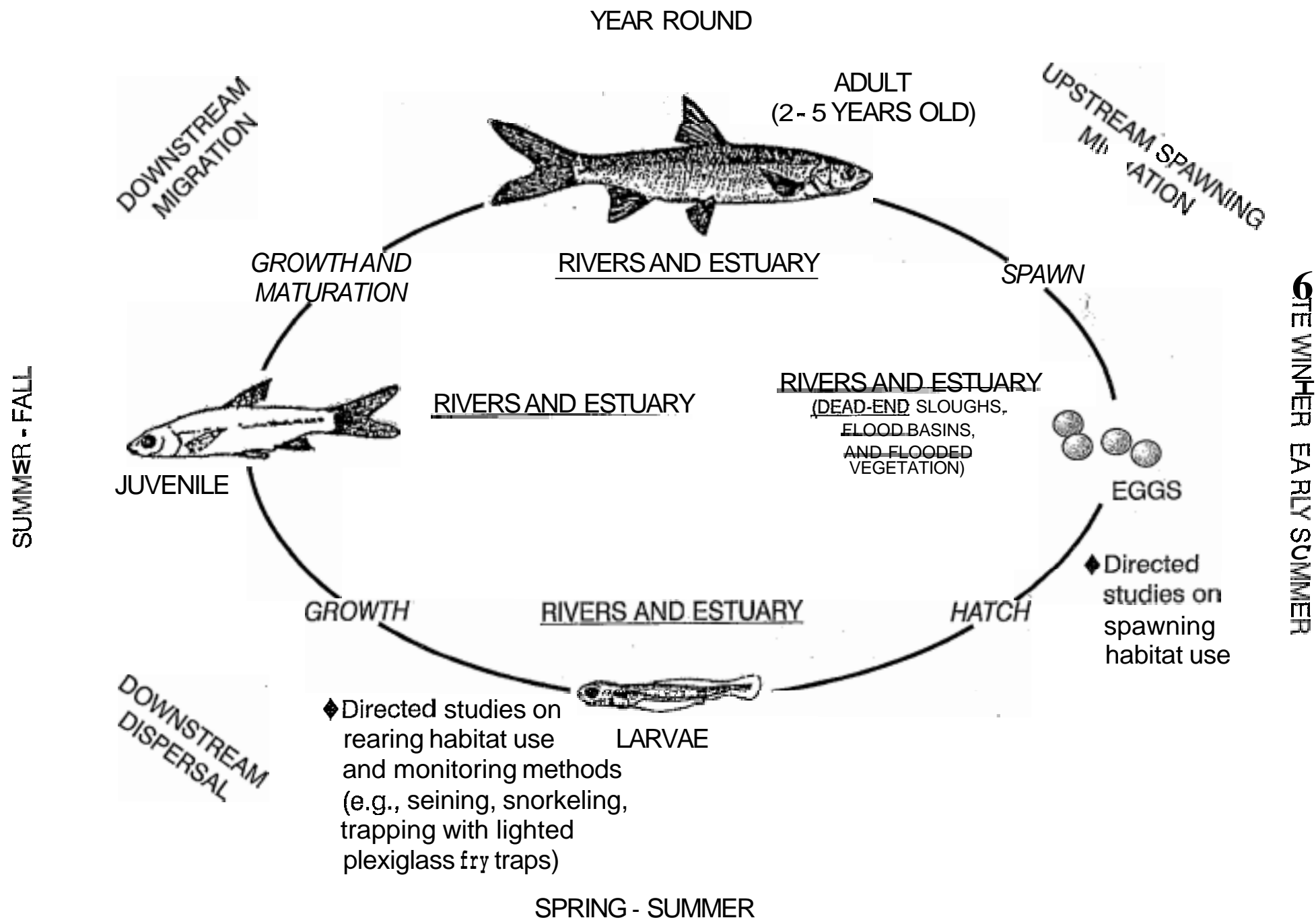


Figure 12. Sacramento Splittail Lifecycle with Fish Population Monitoring Plan



CALFED, CVPIA Goals.

CALFED, CVPIA and AFRP goals that will be addressed in the FISH Plan are compared to FISH Plan goals in Table 1. Each of the FISH Plan's desired outcomes and goals contribute to CALFED or CVPIA/AFRP goals.

CALFED Uncertainties

The CALFED uncertainties for which the FISH Plan projects will result in a substantial improvement in knowledge are described below.

Natural Flow Regimes. FISH Plan projects that address appropriate flows for the three at-risk species will have as an objective better understanding the mechanisms underlying these species' responses to hydrologic processes, including low-flow conditions and the role of fall pulse flows as a trigger to upstream migration for adult fall-run salmon. Projects that will be considered in the FISH Plan include: monitoring projects to better estimate geomorphic thresholds; monitoring and modeling to develop or refine flow-temperature relationships; research projects that examine the mechanisms underlying native species' responses to flow; simulation and operational modeling to evaluate options for obtaining water to meet environmental needs; and, monitoring and modeling to develop or refine relationships between flow and contaminant concentrations, bioavailability, and resultant dose and exposure to biota,

Channel Dynamics, Sediment Transport and Riparian Vegetation. FISH Plan projects that address channel dynamics, sediment transport and riparian vegetation to improve conditions for the three at-risk species will have as an objective better understanding the mechanisms underlying the species' responses to these physical processes. Restoration of geomorphic processes will be a key part of the FISH Plan because these physical processes are necessary to help create and maintain the riparian and instream habitats that other FISH Plan projects will be enhancing.

Flood Management as an Ecosystem Tool. Projects that will be considered in the FISH Plan include: clarifying how ecosystem restoration efforts, such as riparian re-vegetation, gravel augmentation, and channel reconstruction projects affect flood conveyance capacity; and, exploring opportunities to re-construct levees to provide some measure of habitat without reducing levee strength or reducing conveyance capacity.

Placement and monitoring of tracer gravels and riparian re-vegetation projects would be structured and monitored to enhance understanding of how native and/or non-native species of riparian vegetation respond to flow components,

Adaptive Management

Adaptive management will occur at two levels under the proposed project. At the primary level, the Technical Subcommittee, with technical assistance and facilitation funded in part by CALFED, will develop the design of the enhanced CDFG monitoring program, establish appropriate monitoring protocols and metrics, evaluate the output of the monitoring program on an ongoing basis, recommend adjustments to the program as necessary, and produce a summary of the results. Given the composition of the Technical Subcommittee, this collaborative management effort will function in effect as a peer review process designed to maintain the scientific rigor of the monitoring program and ensure widespread acceptance of its results.

At the secondary level, members of the Subcommittee will exchange information with the members of the working groups responsible for adaptively managing the RCMP early implementation projects and

will correlate monitoring program output with project design and operation data. This exchange will occur under the auspices of the FISH Group and the LAR Task Force with technical assistance and facilitation services funded in part by CALFED as shown in Summary Budget, Figure 1. The goal will be to identify opportunities for improved project management based on the results of CDFG's of the monitoring program,

Educational objectives

The project will increase awareness and understanding of CALFED's ERP goals among local, state, and federal agencies, environmental groups, business interests, commercial and recreation fishing organizations, and homeowners and citizens organizations that comprise the FISH Group, the LAR Task Force, and the Water Forum. (See discussion under Local Involvement.)

Activities, lectures, and materials will be shared through these groups. In addition, a State of the River report, which will be prepared under the RCMP process for a layperson audience, will be published and made available to the LAR Task Force and Water Forum members. Baseline data, monitoring reports, and evaluations will be shared with federal state agencies as well as non-governmental organizations.

Proposed Scope of Work

Location and/or Geographic Boundaries of the Project

The project is located entirely within Sacramento County in the Lower American River Ecozone. The project covers the American River corridor between the Sacramento River and Nimbus Dam, bounded on the north and south by levees in the lower reach and bluffs and high terraces in the upper reach. Enclosed is a quad map showing an outline of the project. The Lower American River centerpoint coordinates are: 21 86696, 331924, California Coordinates, Zone 2, in feet, NAD 1927.

Approach/Monitoring and Assessment Plans

Task 1. Refine Hypotheses and Develop Research Protocols, Including Metrics. In this first year of the RCMP, the overall approach is to develop projects based on a solid foundation of knowledge about the Lower American River ecosystem. The Baseline Report will provide that source of knowledge, compiling available information on fisheries, including fall-run chinook salmon, steelhead, and splittail population size and trends, river flows and water temperatures, riparian attributes, and instream habitats. Upon this base of knowledge on the status of the at-risk species and the quality and availability of their habitat, projects and priorities for implementation will be developed.

For each project, hypotheses will be refined from the concepts of ecosystem, processes and stressors presented on Figures 1 through 5. The project will use a framework of an experimental design so that the outcome of the project can be added to knowledge of the ecosystem and its components and could be applied to other projects. The Technical Subcommittee will work with CDFG to develop the monitoring program, including appropriate metrics and protocols. The data collected will include fish and wildlife habitat use analyzed using standard statistical methods suitable for data arising from ecological field experiments, that generally do not conform to normality. Specific sampling, analytical, planning and construction procedures for each project will be developed at project definition, including methods/techniques, equipment and facilities, data collection, statistical analysis and quality assurance procedures. Thorough peer review by agency and academic experts will be an integral part of the study design and data evaluation. Finally, the Technical Subcommittee and CDFG will coordinate with the Reservoir Operations Working Group and the Floodway Management Working Group to clarify the design and operation of the RCMP early implementation projects. This

,coordination will occur through the FISH Group and the LAR Task Force. It will ensure that the monitoring program is properly designed to measure the impacts of these RCMP projects.

Task 2. Intensive Monitoring to Test Hypotheses. CDFG will conduct intensive monitoring for each project to test the corresponding hypothesis. The monitoring plan will include monitoring of the narrow objective of the project (e.g., optimize seasonal temperature regime), and the ultimate desired outcome (e.g., increase and maintain viable populations of naturally spawning fall-run chinook salmon and steelhead). Fish population monitoring would begin immediately to establish a pre-project baseline. Under Task 2, CDFG will implement the population-monitoring program with review and oversight provided by the Technical Subcommittee. CDFG will provide quarterly reports to the Technical Subcommittee on the progress and results of the work in the field. The Subcommittee will evaluate these reports and recommend appropriate adjustments as necessary to achieve the goals of the monitoring program,

Task 3. Analyze Monitoring Results and Incorporate into Adaptive Management Decisions. Under Task 3, CDFG and the Technical Subcommittee will collaborate on a final report summarizing and analyzing the results of the monitoring program and making recommendations on future steps for gathering additional population data on the target species. This report will be used by the Reservoir Operations Working Group and Floodway Management Working Group to make adjustments in the design and operation of the RCMP early implementation projects and in additional projects that will be developed through the RCMP planning process.

Data Handling and Storage

Data collection will consist of the following documents: a Bibliography of Documents Relevant to the Fisheries and Aquatic Habitat Management and Restoration Plan for the Lower American River, a Baseline Report on the Lower American River, a Fisheries and Aquatic Habitat Management and Restoration Plan for the Lower American River, and a State of the River report. The Ecological and Biological Monitoring Plan will also incorporate a Quality Assurance Project Plan strategy including data handling, records retention and storage. All reports will be available to the public.

Expected Products/Outcomes

An annual timeline with start and stop dates, and accomplishment of major milestones is described below as well as the proposal's list of planned reports and presentations.

Year 1:

- | | |
|---|--|
| May, 2001 | Initiate Task 1 , "Develop Research Protocols, Including Metrics." |
| June, 2001 | Draft Refined Year 1 Monitoring Plan (research protocols, and metrics directly related to Summer, 2001 data collection). |
| June, 2001 | Initiate Task 2 , "Intensive Monitoring to Test Hypotheses" |
| August, 2001 | Final Refined Year 1 Monitoring Plan (covering all Year 1 hypotheses, research protocols, and metrics). |
| Sept. 2001
& Quarterly
Thereafter | Monitoring Progress Report (submitted to FISH Group's Technical Subcommittee by leaders of funded monitoring projects). Remaining Year 3 progress reports due in December 2001 & March 2002. |
| Sept., 2001 | Initiate Task 3 , "Analyze Monitoring Results & Incorporate Into Adaptive Management Decisions" |

March, 2002 Research Findings Report (submitted to FISH Group's Technical Subcommittee jointly by leaders of funded monitoring projects).

April, 2002 Updated Fisheries and Aquatic Habitat Management and Restoration Plan for the Lower American River

April, 2002 Annual Health-of-the-River Report

Year 2:

May, 2002 Refined Year 2 Monitoring Plan

June, 2002 & Quarterly Thereafter Monitoring Progress Report (submitted to FISH Group's Technical Subcommittee by leaders of relevant monitoring projects), Remaining Year 2 progress reports due in September & December of 2002 & March 2003.

March, 2003 Research Findings Report (submitted to FISH Group's Technical Subcommittee jointly by leaders of funded monitoring projects).

April, 2003 Updated Fisheries and Aquatic Habitat Management and Restoration Plan for the Lower American River

April, 2003 Annual Health-of-the-River Report

Year 3:

May, 2003 Refined Year 2 Monitoring Plan

June, 2003 Quarterly Thereafter Monitoring Progress Report (submitted to FISH Group's Technical Subcommittee by & leaders of relevant monitoring projects). Remaining Year 3 progress reports due in September & December of 2003 & March 2004.

March, 2004 Research Findings Report (submitted to FISH Group's Technical Subcommittee jointly by leaders of funded monitoring projects).

April, 2004 Updated Fisheries and Aquatic Habitat Management and Restoration Plan for the Lower American River

April, 2004 Annual Health-of-the-River Report

April, 2004 Complete Tasks 1-4.

Work Schedule

The following schedule describes the proposal's start and completion dates for the Tasks described in this proposal.

<u>Task</u>	<u>Start Date</u>	<u>Completion Date</u>
1. Refine Hypotheses & Develop Research Protocols: Including Metrics	May, 2001	May, 2004 ¹

¹ Once grant funds become available, refinement of testable hypotheses and research protocols will be top priority to enable monitoring to begin. Related refinements of framework plan may continue throughout grant period consistent with adaptive management.

2. Intensive Monitoring to Test Hypotheses	June, 2001	April, 2004
3. Analyze Monitoring Results & Incorporate into Adaptive Management Decisions	September, 2001	April, 2004
4. Project Management	May, 2001	April, 2004

Feasibility

This science-based approach to adaptive management of the LAR is feasible and appropriate because the goals of the RCMP are consistent with the goals of the numerous agencies with jurisdictional responsibilities for the LAR, and the other stakeholders involved in the planning process. This consensus approach is key to creating a planning document that will be implemented and that is consistent with past and future planning efforts.

The project can be completed in the time allotted because current efforts are on schedule, and representatives of responsible agencies are participating in the project. The stakeholder groups involved in this process have worked together in other contexts and venues and have a history of success over several years. It is anticipated that any agreements needed with these agencies will be authorized in an expedient manner.

More specifically, this approach to testing hypotheses is feasible and appropriate because CDFG is the primary entity monitoring on the LAR and, therefore, has the greatest level of expertise. For the past several years, CDFG has monitored numerous fisheries parameters in the LAR including spawning habitat utilization, spawning gravel characterization, rearing, and outmigration. In addition, CDFG continues to address flow fluctuation and spawning gravel enhancement issues in the LAR.

ERP Goals and CVPIA Priorities

CALFED ERP, CVPIA and ~~AFRP~~ goals that coincide with FISH Plan goals are identified in Table 1. Each of the FISH Plan desired outcomes and goals contribute to CALFED or ~~CVPIA/AFRP~~ goals. FISH Plan desired outcomes target particular fish species, and FISH Plan goals target lifestages. The draft objectives are based on these goals and the stressors identified in the USFWS, CDFG, and CALFED documents referenced earlier. These stressors were identified in **Figures 1 through 5**. The consistency of FISH Plan goals with ERP and CVPIA goals will directly lead to progress toward the latter goals.

Relationship to Other Ecosystem Restoration Projects

The RCMP is the next phase of the CALFED funded project. The results of these hypotheses will be available to guide all ecosystem restoration projects and overall adaptive management of the Lower American River.

System-Wide Ecosystem Benefits

The LAR contributes 15 percent of the flow of the Sacramento River and provides spawning, rearing and foraging habitat for anadromous and resident native fish species that use the Sacramento-San Joaquin Delta. It provides significant habitat for Delta and other Central Valley species. Large areas of historic floodplain contained within the levee system offer opportunities for enhanced ecological functions related to frequent high flow events. The RCMP will benefit these species and therefore benefit the Delta ecosystem.

FISH Plan Goals That Coincide with CALFED ERP Goals, CVPIA Priorities, and AFRP Goals

Table 1

FISH PLAN DESIRED OUTCOMES/GOALS	CALFED ERP GOALS	CVPIA GOALS	AFRP GOALS
Increase and maintain viable populations of naturally spawning fall-run chinook salmon and steelhead	Goal 1. Recover fall-run chinook salmon and steelhead.	Protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley; and address impacts of the CVP on fish, wildlife and associated habitats.	Double natural production of anadromous fish in the Central Valley.
Provide appropriate spawning and rearing habitat quality and quantity	Goal 2. Rehabilitate natural ecosystem processes and biotic communities. Goal 4. Rehabilitate habitat for at-risk species. Goal 5. Reduce impact of non-native invasive species. Goal 6. Improve and maintain sediment and water quality	Restore and replenish, as needed, spawning gravel lost due to the construction and operation of CVP facilities. Eliminate, to the extent possible, losses of anadromous fish due to CVP-caused flow fluctuations. Protect and restore natural channel and riparian habitat values through habitat restoration actions and modifications to CVP operations.	Improve stream habitat for all life stages of anadromous fish through improved flows, water quality, and physical habitat.
Provide appropriate juvenile outmigration and adult upstream conditions	Goal 2. Rehabilitate natural ecosystem processes and biotic communities.	Provide CVP flows of suitable quantity and timing to protect anadromous fish. Use short pulses of increased water flows to increase survival of migrating anadromous fish.	Improve adult escapement rates by modifying barriers that impede migration.
Balance in-stream harvest and hatchery operation	None	None	Integrate habitat restoration efforts with harvest and hatchery management.
Reduce adverse effects of water diversion intakes	None	Develop and implement measures to avoid losses of juvenile anadromous fish resulting from unscreened or inadequately screened diversions.	Improve survival rates by reducing or eliminating entrainment of juveniles at diversions.
Achieve and maintain a viable population of splittail	Goal 1. Recover splittail.	None	None
Provide appropriate spawning and rearing habitat quality and quantity	Goal 2. Rehabilitate natural ecosystem process and biotic communities. Goal 4. Rehabilitate habitat for splittail. Goal 5. Reduce impact of non-native invasive species.	None	None

;QUALIFICATIONS

Jonas Minton (Water Forum) is the Executive Director of the Water Forum, responsible for managing staff and consultant assistance to the Water Forum. He managed the EIR for the Water Forum Agreement, which includes protection of the Lower American River as a co-equal objective. Earlier in his career, he was on the team that successfully completed the Environmental Impact Report/Environmental Impact Statement to support the wild and scenic river designation of the Lower American, Trinity, Eel, Klamath, and Smith rivers.

Paul Bratovich, M.S., (SWRI) has worked as a fisheries consultant and water resources specialist in California for the past 17 years. He has conducted numerous LAR investigations including the design, implementation, analysis, and report preparation of habitat classification and mapping, application of the IFIM, estimation of chinook salmon abundance and distribution by habitat type, chinook salmon micro-habitat suitability data acquisition, and outmigration, flow, and water temperature evaluations for chinook salmon and steelhead. He evaluated the benefits of shutter reconfiguration at Folsom Dam for downstream temperature control, the benefits of a temperature control device at Folsom Dam, and the development of optimal coldwater pool management software to assist USBR management of Folsom Reservoir's coldwater pool for chinook salmon and steelhead. Mr. Bratovich served as a technical expert on the Alameda County Superior Court LAR Technical Advisory Committee. He serves as a technical liaison with state and federal resource agencies to integrate the flow pattern for the LAR with the AFRP. Mr. Bratovich is the Principal in Charge for the American River Basin Cumulative Impact Analysis which will evaluate more than 30 potential water-related actions affecting the American River Basin, and will become an integral part of future EISs, EAs and BAs prepared within this region. Mr. Bratovich wrote the LAR section of the AFRP Draft Working Plan on behalf of the FWS, served as the lead scientist on CALFED's LAR Technical Team, and continues to serve as the principal scientist for the Water Forum, and as a member of the American River Operations Group.

Steven Chainey, M.S., (Jones & Stokes Associates) is a recognized leader in wetland and riparian ecology, management and restoration and has worked extensively with federal, state and local agencies to achieve successful restoration efforts on large-scale wetland and riparian enhancement projects. He has managed preparation of environmental impact assessments, constraints analyses, and management plans for numerous resource management projects in the Central Valley, and understands the relationships of flood control hydraulics, reservoir operations, and river and floodplain management and their effects on natural vegetation types, channel and floodplain geometry, and conditions for fish and wildlife habitat. Mr. Chainey was the lead ecologist on Jones & Stokes Associates's team that prepared the LAR Floodway Management Plan.

Mnrcele DuPraw, M. S., (California Center for Public Dispute Resolution) is a Senior Mediator and Program Manager at the Center. She holds a Bachelor's degree in Environmental Studies from the University of California at Santa Cruz, as well as a Master's in natural Resource Policy, Economics, and Management from the University of Michigan at Ann Arbor. Ms. DuPraw has specialized in environmental and cross-cultural consensus building for the ensuing fifteen years providing facilitation and mediation for complex, multi-party public policy controversies. Ms. DuPraw currently serves as the lead mediator/facilitator for the Lower American River Task Force and for the Task Force's Fisheries and In-Stream Habitat (FISH) Group.

Planned organization of staff and other resources to be used in implementing this project. The Water Forum will be the responsible party for contracting with and managing the facilitation and technical consulting services needed for the FISH Group and the FISH Group Technical Subcommittee as well as providing administrative support to those groups. SAFCA will be responsible for contracting with and managing the facilitation and technical consulting services for the FMWG as well providing administrative support and for the contracting with and managing the design, construction, and

monitoring activities of their projects to improve temperature control facilities, floodplain habitat, and shaded riverine aquatic habitat. Management staff of both the Water Forum and SAFCA will jointly be responsible for providing coordination activities for the development of the RCMP. The CDFG will be responsible for hiring and supervising the biologists whose tasks it will be to perform the monitoring activities, including those of the target fish species. The CDFG will also be responsible for purchasing the appropriate monitoring equipment, after consultation with the FISH Technical Subcommittee, in order to carry out their assigned responsibilities.

Nature and extent of other collaborating participants in the implementation of this project. The Sponsoring Agencies include the Water Forum (comprised of 40 stakeholder organizations including business and agricultural leaders, environmentalists, citizen groups, water managers, and local governments) and the Sacramento Area Flood Control Agency (SAFCA). The Supporting entities include the California Department of Fish & Game (CDFG), the Lower American River Task Force (comprised of community groups, environmental and recreation interests, flood control agencies, and state and federal resource agencies) and the FISH Group (comprised of federal and state resource agencies, fishing/boating/environmental interests, flood control agencies, local governments, and partnerships such as CALFED and the Water Forum).

Individual responsibilities covering technical, administrative and project management roles.

The project management/oversight team will include: Jonas Minton, Water Forum; Tim Washburn, SAFCA; and Bill Snider, CDFG. Administrative/management support will be provided by Susan Davidson of the Water Forum. Facilitation support will be provided by Marcelle DuPraw, CCPDR, for the LAR Task Force, the FISH Group and the FISH Group Technical Subcommittee; and Gregg Ellis, JSA, for the FMWG and the BPWG. Paul Bratovich and staff of SWRI will provide technical support for both the FISH Group and the FISH Group Technical Subcommittee.

Conflict of Interest Statement. Project sponsors have not identified any direct conflicts between the interests of the sponsors themselves, or the interest of their sub-consultants, CCPDR, SWRI, JSA, and the objectives and interests of the CALFED program.

'COST

1. Budget

Task 1 – Refine Hypotheses & Develop Research Protocols Including Metrics

This task will be performed jointly by the FISH Group and the FISH Group Technical Subcommittee with technical fishery and facilitation assistance. This task will produce: Draft and Final Refined Year 1, Year 2 and Year 3 Monitoring Plans; Annual Health-of-the-River Reports; and an annual Updated Fisheries and Aquatic Habitat Management and Restoration Plan for the Lower American River. It is proposed that the Water Forum HME fund the facilitation portion of the costs and that CALFED fund a portion of the technical assistance at \$83,333 per year, for a total of \$250,000 for the three year period.

Task 2 – Intensive Monitoring to Test Hypotheses

This task will be performed by the CDFG. It will entail the hiring of four (4) FTE: one (1) Senior Biologist –Fisheries, and three (3) Biologists –Fisheries as well as the purchase of fish monitoring equipment such as traps, seines, and sampling gear. This task will produce quarterly Monitoring Progress Reports and annual Research Findings Reports. It is proposed that CALFED fund this portion of the proposal with a one-time, first-year budget for equipment of \$90,000 and a three year budget for the 4 FTE including salaries, benefits and CDFG overhead rate of 20% for an annual cost of \$499,000².

Task 3 – Adaptive Management

Costs associated with the adaptive management tasks proposed to be funded by CALFED include:

FISH Technical Subcommittee - CALFED - technical support - \$400,000

FISH Group - CALFED - remaining technical support - \$350,000

Project Management Tasks – Project management/oversight of the CALFED grant will be provided by management and administrative staff of the Water Forum. The costs associated with this activity will be funded via the cost share from the Water Forum's Habitat Management Element's financial supporters.

2. Cost-Sharing

The funding commitment of the Water Forum comes from the Water Forum Stakeholder organizations via their commitment to fund the Habitat Management Element of the Water Forum Agreement. The Water Forum Agreement was signed by all 40 Stakeholder organizations at a signing ceremony in April 2000. Some of the funding commitment of SAFCA has already been approved in previous actions of the SAFCA Board regarding various design, construction and monitoring activities in the LAR. The funding commitment to improve the temperature control facilities at Folsom Dam is contingent upon the approval of the proposed SAFCA assessment to fund the local share of the Sacramento flood control improvement projects. Ballots have already been mailed to property owners in Sacramento County. The passage of the assessment will be known by the end of June 2000.

The following projects and adaptive management activities are those which will be funded in all or part by either the Water Forum or SAFCA. The amount of money listed is the amount to be funded only by the cost-sharing partners. The amount requested from CALFED is identified below in the three attached budget tables as well as in the Budget Summary, Figure 1.

² Assume Biologist salary at \$3,000/month with 25% benefits and 20% CDFG overhead = \$54,000/year, and Senior Biologist salary at \$4,900/month with 25% benefits and 20% overhead = \$88,200/year.

Projects:

Improve Temperature Control Facilities at Folsom Dam – SAFCA - \$2 Million

SAFCA is funding modifications to the temperature control shutters at Folsom Dam to improve the coldwater pool management at Folsom Reservoir. These modifications are being made to offset any temperature-related impacts that might otherwise result from the variable-space storage operation at Folsom. Modification to the temperature control shutters will allow greater control over the depth, and hence the temperature, at which water is released from Folsom Reservoir and will improve the ability to maintain the coldwater pool throughout the summer months.

Update Lower American River Flow Standard - Water Forum - \$75,000

One of the agreed upon assurances within the Water Forum Agreement is an updated Lower American River (LAR) Flow Standard. All signatories have agreed that they will recommend to the State Water Resources Control Board (SWRCB) a flow standard that will incorporate the Water Forum Agreement provisions on water diversions under varying hydrologic conditions and optimize the release of available water for the fisheries. The City of Sacramento and the Water Forum are co-leads in the pursuit of this update of the Lower American River Flow Standard. The City, with support from other signatories to the Water Forum Agreement, has already requested the SWRCB to expedite the updating of the Standard.

Improve Floodplain Habitat in the Lower American River – SAFCA - \$1 Million

SAFCA will implement floodplain habitat improvements in the LAR for Sacramento splittail spawning and rearing. The proposed restoration approach is to replicate or enhance slough and/or sidechannel lentic (still or low-velocity) aquatic habitats on the wide northern floodplain of the river between River Miles 0 and 5 (right bank). Existing habitats will be replaced with higher quantity and quality riparian, wetland, and aquatic habitat. Restoration will focus on the creation of connectivity to the river channel and extensive inundation of lower floodplain surfaces. By establishing river connectivity at the entire range of flows, this approach can be used to eliminate isolated ponds that currently entrap fish and enhance the spawning function of existing woody riparian vegetation that may be growing on lower elevations of the floodplain.

Improve Shaded Riverine Aquatic Habitat in the Lower American River – SAFCA - \$1.6 Million

SAFCA is involved in the implementation of several projects along the LAR that modify the physical structure within the river corridor with the intent of increasing flood safety and creating a self-sustaining riparian corridor. First, SAFCA is responsible for maintaining and monitoring the success of innovative vegetation features constructed as components of recently implemented bank protection projects on the LAR. The goal of constructing the vegetation features is to provide riparian and shaded riparian aquatic habitat. Maintenance and monitoring activities funded by SAFCA include watering and weeding the vegetation, remediating vegetation mortality, archiving as-built construction/planting specifications, tracking and recording modifications to the as-built specifications, keeping monthly logs of maintenance activities, recording vegetation height, width, canopy and percent survival, photographic documentation, and preparation of annual reports documenting monitoring results. Maintenance activities will range in duration from 3 to 8 years. Monitoring activities will be carried out for 8 years. SAFCA's ongoing maintenance and monitoring efforts are being coordinated with the RCMP's Ecological and Biological Monitoring and Evaluation Strategy.

Adaptive Management:

–

American River Operations Group - Water Forum - \$35,000

The Water Forum attends the American River Operations Group (AROG) on a monthly basis in order to ensure that real time adaptive management decisions continue to protect the fisheries of the Lower American River,

Floodway Management Working Group – SAFCA - \$300,000

The purpose of the Floodway Management Working Group (FMWG) is to work collaboratively with SAFCA to develop two key components of the Floodway Management of the RCMP. They are the Vegetation Resource Management Program and the Facilities Redesign and Relocation Program. The FMWG will use the monitoring information that they learn from the two projects above (Improve Floodplain Habitat in the LAR and Improve Shaded Riverine Aquatic Habitat in the LAR) to provide input to the Floodway Management portion of the RCMP.

FISH Technical Subcommittee – Water Forum - \$246,666

The purpose of the FISH Technical Subcommittee is to provide the FISH Group with rigorous technical input and review of: (a) its monitoring and evaluation program; and (b) priorities and projects proposed for inclusion in the FISH Plan,

FISH Group – Water Forum - \$643,334

The vision of the FISH Group is “To Protect, Enhance, and Restore the Fisheries and Aquatic And Riparian Habitat Values of the Lower American River Ecosystem.” The FISH Group is also responsible for developing the aquatic habitat management element of the RCMP, (also known as the “FISH Plan”), which is taking the form of a fisheries and aquatic habitat management and restoration plan for the Lower American River.

LAR Task Force - \$600,000

The major objective of the LAR Task Force is to identify opportunities for improving existing flood control facilities and management strategies along the LAR while at the same time protecting and enhancing the existing environmental and recreational resources in the American River Parkway. In the development of the RCMP, the LAR Task Force integrates the efforts of: (A) the Floodway Management Working Group (FMWG) and Bank Protection Working Group (BPWG) in developing the floodway management element; and (B) the Fisheries and In-Stream Habitat (“FISH”) Group in developing the aquatic habitat management element.

Table 1. Year 1 budget - Next-Phase Funding: SCIENCE BASED ADAPTIVE MANAGEMENT OF THE LAR (CALFED funds only)

Year	Task	Direct Labor Hours	Subject to Overhead						Exempt from Overhead	
			Salary - 75%	Benefits - 25%	Travel	Supplies & Expendables	Service Contracts	Overhead - CDFG	Equipment	
Year 1	Task 1 Refine Hypotheses & Develop Research Protocols Including Metrics									
	Subtask 1 - Fisheries Technical Consulting						\$83,333	0%		\$83,333
	Task 2 Intensive Monitoring to Test Hypotheses									
	Subtask 2 - In-stream monitoring	3 Biologists, 1 Sr. Biologist	\$166,000	\$41,500				20%	\$90,000	\$339,000
	Task 3 Analyze Monitoring Results & Incorporate into Adaptive Management Decisions									
	Subtask 3 - Fisheries Technical Consulting						\$166,667	0%		\$166,667
	Project Management		Water Forum	Water Forum	Water Forum	Water Forum		0%		\$0
	Total Cost Year 1		\$166,000	\$41,500	\$0	\$0	\$250,000		\$90,000	\$589,000

Table 2. Year 2 budget - Next-Phase Funding: SCIENCE BASED ADAPTIVE MANAGEMENT OF THE LAR (CALFED funds only)

Year	Task	Direct Labor Hours	Subject to Overhead						Exempt from Overhead	
			Salary - 75%	Benefits - 25%	Travel	Supplies & Expendables	Service Contracts	Overhead - CDFG	Equipment	Total cost
Year 2	Task 1 Refine Hypotheses & Develop Research Protocols Including Metrics									
	Subtask 1 - Fisheries Technical Consulting						\$83,333	0%		\$83,333
	Task 2 intensive Monitoring to Test Hypotheses									
	Subtask 2 - In-stream monitoring	3 Biologists, 1 Sr. Biologist	\$166,000	\$41,500				20%		\$249,000
	Task 3 Analyze Monitoring Results & Incorporate into Adaptive Management Decisions									
	Subtask 3 - Fisheries Technical Consulting						\$166,667	0%		\$166,667
	Project Management		Water Forum	Water Forum	Water Forum	Water Forum		0%		\$0
	Total Cost Year 2		\$166,000	\$41,500	\$0	\$0	\$250,000		\$0	\$499,000

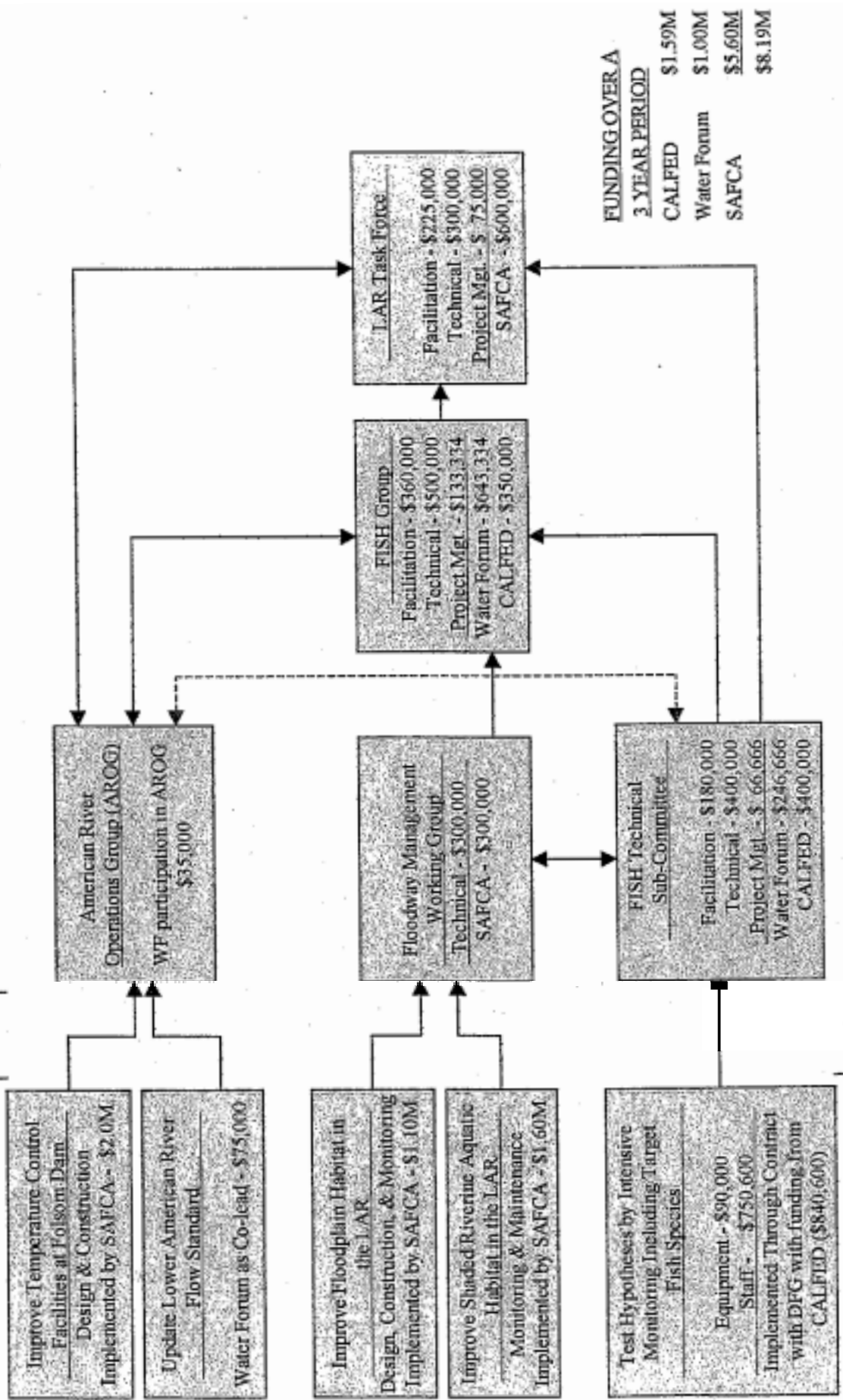
Table 3. Year 3 budget - Next-Phase Funding: SCIENCE BASED ADAPTIVE MANAGEMENT OF THE LAR (CALFED funds only)

Year	Task	Direct Labor Hours	Subject to Overhead						Exempt from Overhead	
			Salary - 75%	Benefits - 25%	Travel	Supplies & Expendables	Service Contracts	Overhead - CDFG	Equipment	
Year 3	Task 1 Refine Hypotheses & Develop Research Protocols Including Metrics									
	Subtask 1 - Fisheries Technical Consulting						\$83,333	0%		\$83,333
	Task 2 Intensive Monitoring to Test Hypotheses									
	Subtask 2 - In-stream monitoring	3 Biologists, 1 Sr. Biologist	\$166,000	\$41,500				20%		\$249,000
	Task 3 Analyze Monitoring Results & Incorporate into Adaptive Management Decisions									
	Subtask 3 - Fisheries Technical Consulting						\$166,667	0%		\$166,667
	Project Management		Water Forum	Water Forum	Water Forum	Water Forum		0%		\$0
	Total Cost Year 3		\$166,000	\$41,500	\$0	\$0	\$250,000		\$0	\$499,000
										\$499,000

NEXT PHASE FUNDING: SCIENCE BASED ADAPTIVE MANAGEMENT OF THE LAR

PROJECTS

ADAPTIVE MANAGEMENT



MONITORING

LOCAL INVOLVEMENT

Describe a plan for public outreach to groups or individuals that may be affected by the project. Attached are copies of the notification letters to both the City of Sacramento and County of Sacramento Clerks and Planning Departments. In addition, representatives from both the City and County are aware of this proposal since they are members of the Water Forum, the LAR Task Force, and the FISH Group.

Progress reports will be made to the "Interested Parties" listings of the Water Forum (700+ names), the LAR Task Force, and the FISH Group. These Progress reports may take the form of a memo and/or article for inclusion in others' newsletters or on their websites. The Progress reports will also be included in the Water Forum and FISH Group's websites. The Progress reports will provide recipients with an opportunity to review and comment on the work of the FISH Group, the FISH Group Technical Subcommittee, and the fish monitoring data. Points of contact for further information or comments will always be included in the Progress reports,

Press releases to a wide-range of news media and stakeholder publications will be made on a periodic basis. In particular, press releases will be made when documents and data are available for review and comment by the general public.

The main document for public notification and education will be the annual "State-of-the-River Report," which will first be published in February – March 2001. In general, this will be a "layperson's" guide to the baseline health of the Lower American River and will not only characterize the health of the river but will outline the restoration efforts being considered and undertaken by those involved in the development of the RCMP.

Members of the Water Forum, LAR Task Force, and the FISH Group are aware and supportive of this project proposal for SCIENCE BASED ADAPTIVE MANAGEMENT OF THE LAR. The following are "local" groups of one or more of the above:

- Water Forum Environmental Interests (Environmental Council of Sacramento, Friends of the River, Save the American River Association, Sierra Club – Motherlode Chapter – Sacramento Group);
- Water Forum Citizen Interests (League of Women Voters of Sacramento, Sacramento County Alliance of Neighborhoods, Sacramento Taxpayers League);
- LAR Task Force Community Groups (Campus Commons, River Park Neighborhood, Natomas Community, Dos Rios Neighborhood, Sierra Oaks Neighborhood, American River Parkway Foundation);
- LAR Task Force Environmental Organizations (same as Water Forum and including Protect American River Canyons and California Native Plant Society); and
- FISH Group Fishing/Boating/Environmental Interests (American River Guides Association, American River Parkway Advisory Committee, Central California Canoe Club, Golden State Trollers)

We are unaware of any opposition to this proposed project.

Identify any third party impacts. This next phase project will benefit third parties outside the LAR by serving as a model for watershed management, particularly in urbanized areas of the Central Valley. Successful development of the RCMP, including community involvement, consensus building among diverse governmental and non-governmental interests, and initiation of restoration actions could provide important lessons to others involved in local and watershed level restoration and planning efforts that require a careful balance of competing uses of water and aquatic resources.

APPENDIX TO PROPOSAL – SUMMARY OF PROGRESS

Brief Project Description. CALFED reviewers' feedback accompanying our first-year grant (99-N21, awarded late January 2000) urged us to undertake additional outreach to broaden community involvement. Consequently, the Fisheries & In-Stream Habitat (FISH) Group (which will develop the fisheries and aquatic habitat element of the RCMP, or "FISH Plan") consists of 26 primary members (Att. F) representing the following organizations:³

Amer. River Flood Control District;	DWR/Reclamation Board;
Amer. River Guides Association;	Golden State Trollers;
Amer. River Parkway Advis. Comm;	NMFS;
CALFED;	SAFCA;
CDFG;	SARA;
Central California Canoe Club;	State Lands Commission;
City Parks;	USACE;
City Utilities;	USBR
Co. Parks;	USFWS;
Co. Planning;	Water Forum. ⁴
Co. Water Agency;	

The FISH Group has also established a smaller Technical Subcommittee of respected scientists from state and federal natural resource agencies and environmental groups to help identify the most significant restoration opportunities and projects for the LAR, advise the FISH Group on monitoring and metrics, and help interpret the implications of the resulting data for adaptive management. Members include:

Terry Mills (CALFED);	Craig Fleming (USFWS);
Bill Snider (CDFG);	Andy Hamilton (USFWS);
Dennis Smith (NMFS);	Matt Davis (USACE);
Felix Smith (SARA);	Ric Reinhardt (USACE);
Rich DeHaven (USFWS);	David Robinson (USBR).

Current Project Status/Accomplishments/Information Generated/Fiscal Status/Regulatory or Implementation Issues. In the first three months of the project, the FISH Group has already:

- Developed a shared Vision ("To protect, enhance, and restore the fisheries and aquatic and riparian habitat values of the Lower American River ecosystem");
- Agreed upon the specific Charge they are collectively willing to undertake on behalf of LAR fisheries and aquatic and riparian habitat (Att. G)
- Reached consensus on the Work Plan and Schedule that will guide the development of the FISH Plan (Att. H);
- Agreed upon Consensus-Building Guidelines to govern their deliberations (Att. I);
- Reached consensus on the Desired Outcomes and Goals of the FISH Plan (Att. K). These desired outcomes and goals set the parameters for the specific restoration projects to be included in the FISH Plan;
- Begun considering the appropriate Outline for the FISH Plan (Att. L); and
- In conjunction with the LAR Task Force, developed the Outline for the River Corridor Management Plan (Att. M).

³ The list includes 21 organizations because some of the organizations have multiple representatives.

⁴ The appropriate membership was derived from a round of 45 stakeholder interviews, as documented in the Executive Summary Convening Report (Att. J).

Scientific Merit/Hypotheses/Conceptual Model/Adaptive Management Framework. The RCMP will include a slate of agreed-upon, prioritized restoration projects and research recommendations for LAR fisheries and aquatic and riparian habitats, with associated implementation and monitoring strategies centered on specific, testable hypotheses. It will be informed by a review of scientific literature related to LAR fisheries and aquatic habitat, and by a “baseline report” that will document the LAR’s current state of health. The RCMP will include a detailed and rigorous regimen for monitoring the biological and ecological responses of LAR fisheries and related habitat to the restoration actions embodied in the RCMP, as well as an adaptive management strategy providing for ongoing refinements to the RCMP. Relevant conceptual models are described in the body of this proposal. Hypotheses to be tested include:

- Modifying temperature control shutters at Folsom Dam, which will allow releases of cooler water in the summer, will result in a greater population of fall-run chinook salmon and steelhead staying over into the fall.
- Optimizing seasonal releases from Folsom Reservoir, which will raise summer and fall base flows on the LAR, will benefit over-summering juvenile steelhead, as well as fall-run chinook salmon and splittail.
- Establishing ‘extensiveinundation of the lower floodplain and connectivity to the river channel at a greater range of flows, and replacing existing habitats with higher quality and quantity riparian, wetland, and aquatic habitat, will improve spawning conditions for splittail.
- Increasing the quality and quantity of shaded riverine aquatic habitat in the LAR will improve rearing habitat for fall-run chinook salmon, steelhead, and splittail.

Existing Data Collection and Monitoring Program. The FISH Group’s existing data collection has focused on:

- Completion of a Draft Bibliography of Documents Relevant to the Fisheries & Aquatic Habitat Management & Restoration Plan for the Lower American River (Att. E); and
- Development of the Outline for the Baseline Report (Att. N), which will document the LAR’s current state of health and serve as a key point of reference for the intensive monitoring proposed herein.

Conclusion. The LAR Task Force and its work groups have been extraordinarily productive already in the development of the RCMP. The Task Force’s current momentum indicates that it is time to prepare for the next phase – project implementation, intensive monitoring, rigorous hypothesis-testing, and adaptive management.

ATTACHMENTS:

Attachment A:	Letters of Notification
Attachment B:	Land Use Checklist
Attachment C:	Environmental Checklist
Attachment D:	Contract Forms
Attachment E:	Draft Bibliography of Documents Relevant to the Fisheries & Aquatic Habitat Management & Restoration Plan for the Lower American River
Attachment F:	FISH Group Membership Roster
Attachment G:	FISH Group Charge
Attachment H:	FISH Group Workplan & Schedule
Attachment I:	FISH Group Consensus-Building Guidelines
Attachment J:	FISH Group Convening Report Executive Summary
Attachment K:	FISH Group Desired Outcomes and Goals
Attachment L:	FISH Group FISH Plan Outline
Attachment M:	Draft River Corridor Management Plan (RCMP) Outline
Attachment N:	Outline for the Baseline Report

May 9, 2000



Thomas W. Hutchings, Planning Director
County of Sacramento
827 7th Street, Room 230
Sacramento, CA 95814

ATTACHMENT A

**SUBJECT: NOTIFICATION OF WATER FORUM PROPOSAL TO
CALFED FOR NEXT-PHASE FUNDING OF A RIVER
CORRIDOR MANAGEMENT PLAN FOR THE LOWER
AMERICAN RIVER**

660 J STREET, SUITE 260
SACRAMENTO, CA 95814

PHONE 916/264-1999
FAX 916/264-5286

Enclosed is a copy of the Proposal the Water Forum is submitting to the CALFED Bay-Delta Office for an ecosystem restoration program to improve the health of the Bay-Delta ecosystem.

This proposal is a "next-phase" funding proposal to continue the development and implementation of a River Corridor Management Plan (RCMP) for the Lower American River (LAR). The initial RCMP was previously awarded a grant from CALFED in last year's round of project funding.

The project area is entirely within Sacramento County and covers the American River corridor between the Sacramento River and Nimbus Dam, bounded on the north and south by levees in the lower reach and bluffs and high terraces in the upper reach (Figure 1).

As you know, the County of Sacramento is a major cost-sharing partner in the Water Forum along with the City of Sacramento, the cities of Folsom and Roseville, the Placer and El Dorado Water Agencies, and the San Juan Water District. The County also participates in the Lower American River Task Force and the Fisheries and In-stream Habitat (FISH) Group, both of which have been charged with various aspects of the development of the RCMP for the Lower American River.

It will not be until after October 2000 that we will hear if the Water Forum is successful in obtaining the next phase funding from CALFED for the continued development of the RCMP for the LAR. If it is, we will prepare a staff report to the Sacramento County Board of Supervisors that notifies them of the grant award.

If you have any questions about this notification, please contact Susan Davidson at 264-1997.

Sincerely,

Jonas Minton
Executive Director

Cc: Terry Schuften, County Executive

Land Use Checklist

ATTACHMENT B

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.

1. Do the actions in the proposal involve physical changes to the land (i.e. grading, planting vegetation, or breaching levees) or restrictions in land use (i.e. conservation easement or placement of land in a wildlife refuge)?

YES

 X
NO

2. If NO to # 1, explain what type of actions are involved in the proposal (i.e., research only, planning only).

The action is purchase of equipment and funding of positions for the Department of Fish & Game to carry out data collection activities. Addition funding is for contracting for facilitation/mediation and technical consulting services for both the FISH Group and the **FISH** Group Technical Subcommittee. No construction activities would result from this proposal.

3. If YES to # 1, what is the proposed land use change or restriction under the proposal?

- 4.. If YES to # 1, is the land currently under a Williamson Act contract?

YES

NO

5. If YES to # 1, answer the following:

Current land use

Current zoning

Current general plan designation

6. If YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance or Unique Farmland on the Department of Conservation Important Farmland Maps?

YES

NO

DON'T KNOW

7. If YES to # 1, how many acres of land will be subject to physical change or land use restrictions under the proposal? _____

8. If YES to # 1, is the property currently being commercially farmed or grazed?

YES

NO

9. If YES to #8, what are

the number of employees/acre _____

the total number of employees _____

10. Will the applicant acquire any interest in land under the proposal (fee title or a conservation easement)?

YES

 X
NO

11. What entity/organization will hold the interest? n/a

12. If YES to # 10, answer the following:

Total number of acres to be acquired under proposal

Number of acres to be acquired in fee

Number of acres to be subject to conservation easement

13. For all proposals involving physical changes to the land or restriction in land use, describe what entity or organization will:

manage the property

provide operations and maintenance services

conduct monitoring

CDFG

14. For land acquisitions (fee title or easements), will existing water rights also be acquired?

YES

NO

15. Does the applicant propose any modifications to the water **right** or change in the delivery of the water?

YES

NO

16.If YES to # 15, describe

ATTACHEMENT C

1. Do any of the actions included in the proposal require compliance with either the California Environmental Quality Act (CEQA), the National Environmental Policy Act (NEPA), or both?

NO

- ### Lead Agency

- The action is purchase of equipment and funding of positions for the Department of Fish & Game to carry out data collection activities. Addition funding is for contracting for facilitation/mediation and technical consulting services for both the FISH Group and the FISH Group Technical Subcommittee. No construction activities would result from this proposal.

5. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?

YES

NO

Activities would occur on property owned by the **County** of Sacramento, which is a member of the Water Forum, a co-sponsor of this CALFED grant proposal.

1. Please indicate what permits or other approvals may be required for the activities contained in your proposal. Check all boxes that apply.

LOCAL

Conditional use permit	<input type="checkbox"/>
Variance	<input type="checkbox"/>
Subdivision Map Act approval	<input type="checkbox"/>
Grading permit	<input type="checkbox"/>
General plan amendment	<input type="checkbox"/>
Specific plan approval	<input type="checkbox"/>
Rezone	<input type="checkbox"/>
Williamson Act Contract cancellation	<input type="checkbox"/>
Other _____ (please specify)	
None required	<input checked="" type="checkbox"/>

STATE

CESA Compliance	<input type="checkbox"/>	(CDFG)
Streambed alteration permit	<input type="checkbox"/>	(CDFG)
CWA ' 401 certification	<input type="checkbox"/>	(RWQCB)
Coastal development permit	<input type="checkbox"/>	(Coastal Commission/BCDC)
Reclamation Board approval	<input type="checkbox"/>	
Notification	<input type="checkbox"/>	(DPC, BCDC)
Other _____ (please specify)		
None required	<input checked="" type="checkbox"/>	

FEDERAL

ESA Consultation	<input type="checkbox"/>	(USFWS)
Rivers & Harbors Act permit	<input type="checkbox"/>	(ACOE)
CWA ' 404 permit	<input type="checkbox"/>	(ACOE)
Other _____ (please specify)		
None required	<input checked="" type="checkbox"/>	

DPC = Delta Protection Commission
CWA = Clean Water Act
CESA = California Endangered Species Act

USFWS = U.S. Fish and Wildlife Service

ACOE = U.S. Army Corps of Engineers

ESA = Endangered Species Act
CDFG = California Department of Fish
and Game
RWQCB = Regional Water Quality
Control Board
BCDC = Bay Conservation and
Development Comm.

NONDISCRIMINATION COMPLIANCE STATEMENT

STD. 19 (FGV.3-95) FMC

ATTACHMENT D

COMPANY NAME

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990(a-f) and California Code of Regulations, Title 2, Division 4, chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

JONAS Minton

DATE EXECUTED

May 15, 2000

EXECUTED IN THE COUNTY OF

Sacramento

PROSPECTIVE CONTRACTOR'S SIGNATURE

Jonas Minton

PROSPECTIVE CONTRACTOR'S TITLE

Executive Director

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Sacramento City - County Office of Metropolitan Water Planning

STANDARD CLAUSES - CONTRACTS WITH PUBLIC ENTITIES

Workers' Compensation Clause. Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the performance of the work under this contract.

Nondiscrimination Clause. During the performance of this contract, the recipient, Contractor and its subcontractors shall not deny the contract's benefits to any person on the basis of religion, color, ethnic group identification, sex, age, physical or mental disability, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, mental disability, medical condition, marital status, age (over 40), or sex. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination. Contractor shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.), the regulations promulgated thereunder (California Administrative Code, Title 2, Sections 7285.0 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Government Code Sections 11135 - 11139.5), and the regulations or standards adopted by the awarding State agency to implement such article. Contractor or recipient shall permit access by representatives of the Department of Fair Employment and Housing and the awarding State agency upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its books, records, accounts, other sources of information and its facilities as said Department or Agency shall require to ascertain compliance with this clause. Recipient, Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

Availability of Funds. Work to be performed under this contract is subject to availability of funds through the State's normal budget process.

Audit Clause. For contracts in excess of \$10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546.7).

Payment Retention Clause. Ten percent of any progress payments that may be provided for under this contract shall be withheld per Public Contract Code Sections 10346 and 10379 pending satisfactory completion of all services under the contract.

Reimbursement Clause. If applicable, travel and per diem expenses to be reimbursed under this contract shall be at the same rates the State provides for unrepresented employees in accordance with the provisions of Title 2, Chapter 3, of the California Code of Regulations. Contractor's designated headquarters for the purpose of computing such expense shall be: 660, J St., Sacto, CA

Drug-Free Workplace Certification. By signing this contract, the Contractor or grantee hereby certifies under penalty of perjury under the laws of the State of California that the Contractor or grantee will comply with the requirements of the Drug-Free Workplace Act of 1990 (Government Code Section 83.50 et seq.) and will provide a drug-free workplace by taking the following actions:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.
2. Establish a Drug-Free Awareness Program to inform employees about all of the following:
 - (a) The dangers of drug abuse in the workplace.
 - (b) The person's or organization's policy of maintaining a drug-free workplace.
 - (c) Any available counseling, rehabilitation and employee assistance programs, and
 - (d) Penalties that may be imposed upon employees for drug abuse violations.
3. Every employee who works on the proposed contract or grant:
 - (a) Will receive a copy of the company's drug-free policy statement, and
 - (b) Will agree to abide by terms of the company's statement as a condition of employment on the contract or grant.

This contract or grant may be subject to suspension of payments or termination, or both, and the Contractor or grantee may be subject to debarment if the department determines that: (1) the Contractor or grantee has made a false certification, or (2) the Contractor or grantee violates the certification by failing to carry out the requirements noted above.

Americans With Disabilities Act. By signing this contract, Contractor assures the State that it complies with the Americans With Disabilities Act (ADA) of 1990, (42 U.S.C. 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

Former State Employee: a) For the two-year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. b) For the twelve-month period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.

Agreement No. _____

Exhibit _____

ADDITIONAL STANDARD CLAUSES

Recycled Materials. Contractor hereby certifies under penalty of perjury that 100 (enter value or "0" here) percent of the materials, goods and supplies offered or products used in the performance of this Agreement meets or exceeds the minimum percentage of recycled material as defined in Sections 12161 and 12200 of the Public Contract Code.

Severability. If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the Parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

Governing Law. This Agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

Y2K Language. The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant." For purposes of this Agreement a good or service is Year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

Child Support Compliance Act. For any Agreement in excess of \$100,000, the Contractor acknowledges in accordance therewith, that:

1. The Contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing With Section 5200) of Part 5 of Division 9 of the Family Code; and
2. The Contractor, to the best of its knowledge, is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.

**Draft Bibliography of Documents
Relevant to the
Fisheries and Aquatic Habitat
Management and Restoration Plan
for the Lower American River**

Prepared for:

FISH Working Group

Prepared by:

SWRI SURFACE WATER
RESOURCES, INC.

June 2000

- A.A. Rich and Associates. 1987a. Establishing Temperatures Which Optimize Growth and Survival of the Anadromous Fishery Resources of the Lower American River. April 13, 1987. Prepared for McDonough, Holland & Allen.
- A.A. Rich and Associates. 1987b. Report on Studies Conducted by Sacramento County to Determine the Temperatures Which Optimize Growth and Survival in Juvenile Chinook Salmon (*Oncorhynchusshawytscha*). April 13, 1987. Prepared for McDonough, Holland & Allen.
- Aceituno, M.E. 1993. The relationship between instream flow and physical habitat availability for chinook salmon in the Stanislaus River, California. United States Fish and Wildlife Service, Ecological Services.
- Aceituno, M.E. and M.A. Hampton. 1988. Validation of habitat availability determinations by comparing field observations with hydraulic model (IFG-4) output. Pages 322-334 *In* Bovee, K.D. and Zuboy, J.R., editors. Proceedings of a Workshop in the Development and Evaluation of Habitat Criteria, United States Fish and Wildlife Service, Biological Report No. 881 (11).
- Adams, B.L., W.S. Zaugg, and L.R. McLain. 1975. Inhibition of salt water survival and Na-K-ATPase elevation in steelhead trout (*Salmo gairdneri*) by moderate water temperatures. Transactions of the American Fisheries Society, 104:766-769.
- Adams, B.L., W.S. Zaugg, and L.R. McLain. 1973. Temperature effect on parr-smolt transformation in steelhead trout (*Salmo gairdneri*) as measured by gill sodium-potassium simulated adenosine triphosphatase. Comprehensive Biochemistry Physiology, 44A: 1333-1339.
- Ad Hoc IESP Review Team: P. Herrgesell, M. A. Kjelson, J. Arthur, L. Winternitz, and P. Coulston. 1993. "A Review of the Interagency Ecological Study program and Recommendations for Its Revision." Coordinators of the Interagency Ecological Study Program.
- Advisory committee on Salmon and Steelhead Trout. 1971. An Environmental Tragedy! Report on California Salmon and Steelhead Trout: Authorized by Assembly Concurrent Resolution No. 64. 1970 Session. March 15, 1971.
- Advisory Committee on Salmon and Steelhead Trout. 1972. Report on California Salmon and Steelhead Trout: A Conservation Opportunity. Authorized by Assembly Concurrent Resolution No. 64. 1970 Session. California Department of Fish and Game. May 15, 1972
- Advisory Committee on Salmon and Steelhead Trout. 1975. The Time is Now! Report on California Salmon and Steelhead Trout. Authorized by Assembly Concurrent Resolution No. 64. 1970 Session. January 1975.
- Advisory Committee on Salmon and Steelhead Trout. 1986. The Tragedy Continues! Report authorized by Joint Committee on Fisheries and Aquaculture, California Legislature. Chapter 1686, 1986 Statutes.
- Aiken, T.J. 1996. Draft Letter Regarding Coldwater Pool Input for the Environmental Impact Statement/Environmental Impact Report for the P.L. 101-514 Water Service Contract

with attachment. Fax to Surface Water Resources, Incorporated. United States Bureau of Reclamation. November 22, 1996

Alderdice, D. F. and F. P. J. Velsen. 1978. Relation between temperature and incubation time for eggs of chinook salmon (*Oncorhynchus tshawytscha*). Journal of the Fisheries Research Board of Canada. 35:69-75.

Allen, M.A., and T.J. Hassler. 1986. Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest) – chinook salmon. U.S. Fish and Wildlife Service Biol. Rep. 82(11.49). U.S. Army Corps of Engineers, TR EL-82-4.26 pp.

Alley, D.W., Jr. 1974. Thesis. The energetic significance of microhabitat selection by fishes in a foothill Sierra stream. University of California, Davis, California.

American Public Health Association, American Water Works Association, and Water Pollution Control Federation. 1985. Standard Methods for the Examination of Water and Wastewater. Sixteenth Edition.

American River Fisheries Research. 1992. Expert Review Panel Comments and Recommendations. September 3, 1992.

American River Natural History Association. 1992. The Acorn. Volume 65, November-December 1992.

American Society of Civil Engineers. 1975. Sedimentation Engineering. Manuals and reports on engineering practice, No. 54, New York.

Anadromous Fish Restoration Program Core Groups. 1995. Working Paper on Restoration Needs. Habitat Restoration Actions to Double Natural Production of Anadromous Fish in the Central Valley of California. Volume 3. May 9, 1995. Prepared for the United States Fish and Wildlife Service.

Anas, R.E., and S. Murai. 1969. Use of scale characteristics and a discriminant function for classifying sockeye salmon *Oncorhynchus nerka* by content of origin. International North Pacific Fisheries Commission Bulletin 26.

Anonymous. 1994. Estimated Ranges of Fish Flow Needs for Use in the Evaluation of Central Valley Project Improvement Act Alternatives. Central Valley Project Improvement Act/Programmatic Environmental Impact Statement.

Anonymous. n.d. Critical Review of the EDF v. EBMUD Report of the Special Master, Water Years 1990-1993.

Anonymous. n.d. Recommended 1992/93 Lower American River Study Program.

Aqua Resources Incorporated and Holton Associates. 1986. Riparian Planning Design Manual for the Sacramento River, Collinsville to Chico Landing. Prepared for the U.S. Army Corps of Engineers. May 1986.

Authority for Environmental Analysis of Water Transfers. 1991. Notice of Preparation for the Program. Environmental Impact Report on Water Transfers Using the Delta With Technical Assistance. Jones & Stokes Associates.

- Ayres Associates. 1997. Geomorphic, Sediment Engineering, and Channel Stability Analyses. American and Sacramento River, California Project. Final Report. Prepared for U.S. Army Corps of Engineers, Sacramento District. December 1997.
- Azevedo, R.L. and Z.E. Parkhurst. 1958. Office Report. The upper Sacramento River salmon and steelhead maintenance program, 1949-1956. United States Fish and Wildlife Service.
- Bachman, R.A. 1981. A growth model for drift-feeding salmonids: a selective pressure for migration. *In* Salmon and Trout Migratory Behavior Symposium, E.L. Brannon and E.O. Salo, editors. 128-135. June 1981.
- Baggerman, B. 1960. Salinity preference, thyroid activity and the seaward migration of four species of Pacific Salmon (*Oncorhynchus*). Journal of the Fisheries Research Board of Canada, 17:295-322.
- Bailey, H.C. 1992. The effect of agricultural drainage on striped bass (*Morone saxatilis*). WRINT California Department of Fish and Game-202, State Water Resources Control Board 1992 Bay-Delta proceedings, California Department of Water Resources.
- Bain, M.B., J.T. Finn, and H.E. Booke. 1988. Streamflow regulation and fish community structure. Ecology, 69:382-392.
- Baldrige, J.E. and D. Amos. 1982. A technique for determining fish habitat suitability criteria: a comparison between habitat utilization and availability. *In* Proceedings, Symposium of acquisition and utilization of aquatic habitat inventory information. American Fisheries Society, 251-258, Portland, Oregon.
- Baltz, D.M. and P.B. Moyle. 1984a. Segregation by species and size of class of rainbow trout (*Salmo gairdneri*) and Sacramento sucker (*Catostomus occidentalis*) in three California streams. Environmental Biology of Fishes, 10:101-110.
- Baltz, D.M. and P.B. Moyle. 1984b. The influence of riparian vegetation on stream fish communities of California. Pages 183-187 *In* R.E. Warner, and K.M. Hendrix, editors. California Riparian Systems. University of California Press, Berkeley.
- Baltz, D.M., B. Vondracek, L.R. Brown, and P.B. Moyle. 1987. Influence of temperature on microhabitat choice by fishes in a California stream. Transactions of the American Fisheries Society, 116:12-20.
- Banks, J. L., L. G. Fowler, and J. W. Elliott. 1971. Effects of rearing temperatures on growth, body form, and hematology of fall chinook fingerlings. Progressive Fish-Culturist, 33:20-26.
- Barnard, K. and S. McBain. 1994. Standpipe to determine permeability, dissolved oxygen, and vertical particle size distribution in salmonid spawning gravels. United States Fish and Wildlife Service. Fish Habitat Relationships Technical Bulletin. Currents, 15:1-12
- Barnhard, R.A. and J. Parsons. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates Pacific Southwest - steelhead, Biological Report 82[11.60].

- Barron, M.G., B.D. Tarr, and W. L. Hayton. 1987. Temperature-dependence of cardiac output and regional blood flow in rainbow trout, *Salmo gairdneri*. Journal of Fish Biology, 31:735-744.
- Bartholow, J. and T.J. Waddle. 1986. Biological Report. Introduction to stream network analysis. Instream Flow Information Paper No. 22. Washington, D.C. United States Fish and Wildlife Service 86(8).
- Bartholow, J., T. Hardy, K. Bovee, B. Milhous, and T. Waddle. 1989. IF 310, Using the computer based Physical Habitat Simulation System. Course Notebook. November-27-December 1, 1989.
- Bartholow, J.M. 1989. Stream temperature investigations: field and analytic methods. United States Fish and Wildlife Service, Instream Flow Information Paper 13, Biological Report 89 (17).
- Bartholow, J.M., J.L. Laake, C. B. Stalnaker, and S.C. Williamson. 1992. A Generalized Salmonid Population Model with Emphasis on Habitat Limitations. Working Draft. United States Fish and Wildlife Service. April 15, 1992.
- Bartley, D., B. Bentley, J.K.T. Brodziak, R. Gomulkiewicz, M. Mangel and G.A.E. Gall. 1992. Geographical variation in the population genetic structure of chinook salmon from California and Oregon, Fish Bulletin. 90:77-100.
- Barton, B.A., C.B. Schreck, and L.A. Sigismondi. 1986. Multiple acute disturbances evoke cumulative physiological stress responses in juvenile chinook salmon. Transactions of the American Fisheries Society 115:245-251.
- Bauersfield, K. 1978. Stranding of juvenile salmon by flow reductions at Mayfield Dam on the Cowlitz River, 1976. Washington Department of Fisheries Technical Report. 36. January 1978.
- Bauersfield, K. 1977. Effects of peaking (stranding) of Columbia River dams on juvenile anadromous fishes below the Dalles Dam, 1974 and 1975. Washington Department of Fisheries Technical Report. 31.
- Bay Institute, The. 1998. From the Sierra to the Sea; The Ecological History of the San Francisco Bay-Delta Watershed. San Francisco, CA. July 1998.
- Beacham, T.D. and C.B. Murray. 1990. Temperature, egg size, and development of embryos and alevins of five species of Pacific salmon: a comparative analysis. Transactions of the American Fisheries Society 119:927-945.
- Beak Consultants, Incorporated. 1996a. Available New Information. Fax transmittal to De Cuir & Somach. February 28, 1996.
- Beak Consultants, Incorporated. 1996b. Draft Scope of Work for Performing a Comprehensive Technical Evaluation and Integration of Lower American River Fishery Information Obtained Since 1990.
- Beak Consultants, Incorporated. 1996c. Folsom Temperature Profiling. Memorandum to Surface Water Resources, Incorporated. August 15, 1996.

- Beak Consultants, Incorporated. 1996d. Folsom Temperature Profiling. Memorandum to Surface Water Resources, Incorporated. July 18, 1996.
- Beak Consultants, Incorporated. 1996e. Water Temperature Profiling of Folsom Reservoir. Memorandum to Surface Water Resources, Incorporated. November 13, 1996.
- Beak Consultants, Incorporated. 1996f. Water Temperature Profiling of Folsom Reservoir. Memorandum to Rod Hall, United States Bureau of Reclamation. April 16, 1996.
- Beak Consultants, Incorporated. 1995. Sacramento Area Water Plan Forum, Final Fish Biologists Working Session Summary. Prepared for City-County Office of Metropolitan Water Planning. September 1995.
- Beak Consultants, Incorporated. 1992a. Fish and Wildlife Investigations for Folsom Dam and Reservoir Reoperation. Prepared for United States Army Corps of Engineers.
- Beak Consultants, Incorporated. 1992b. Revised 1992/93 Lower American River Study Program. Prepared for the Lower American River Technical Advisory Committee. Prepared for Sacramento County and East Bay Municipal Utility District.
- Beak Consultants, Incorporated: 1991a. List of Tentative Priorities for 1991-1992 Studies. Prepared for the Lower American River Technical Advisory Committee.
- Beak Consultants, Incorporated. 1991b. Materials Submitted by Dr. John G. Williams. Letter to David R. Schuster. August 2, 1991.
- Beak Consultants, Incorporated. 1989a. Raw data: Downloaded from temperature monitors at various locations throughout the Lower American River. March 17, 1987 to May 4, 1989.
- Beak Consultants, Incorporated. 1989b. Yuba River Fisheries Investigations, 1986-88: Appendix D- Evaluation of Microhabitat Utilization for Fall-run Chinook Salmon (*Oncorbyncbus tshawytscha*) in the Lower Yuba River. Draft Report. Prepared for the California Department of Fish and Game.
- Beak Consultants, Incorporated. 1988a. Scope of Work for the 1988-89 Fishery Investigations on the Lower American River, Part I: Investigations. In Consultation with the California Department of Fish and Game. Submitted to McDonough Holland & Allen.
- Beak Consultants, Incorporated. 1988b. Smolt Emigration Assessment, Lower American River Fisheries Investigations. Prepared for McDonough, Holland & Allen. October 1988.
- Beak Consultants, Incorporated. 1988c. Appendix A: Aerial photographs of each habitat unit and IFIM transect surveyed and modeled with the IFG4 Program.
- Beak Consultants, Incorporated. 1988d. Appendix B: Lower American River PHABSIM Calibration Details, Analyses, and Results.
- Beak Consultants, Incorporated. 1988e. Appendix C: Velocity Adjustment Factors for Each IFG4 Input Data Deck for Each Simulation QARD.
- Beak Consultants, Incorporated. 1988f. Appendix D: IFG4 Input Data Decks.

- Beak Consultants, Incorporated. 1987. Proposed Scope of Work for the 1988 Fishery Investigations on the Lower American River. In Consultation with the California Department of Fish and Game. Prepared for McDonough Holland & Allen.
- Beak Consultants, Incorporated and TENERA Environmental Services. 1990. Lower American River Water Temperature Monitoring Program. July 1990.
- Beak Consultants, Incorporated and Hydmet Incorporated. 1992. American River Temperature Models. 1990 Calibration Report. July 1992. Prepared for De Cuir & Somach.
- Beak Consultants, Incorporated, Hydmet Incorporated, and Norman S. Braithwaite, Incorporated. 1992. American River Temperature Model Pond Survey and River Hydraulics. Report to Sacramento County. January 24, 1992.
- Beak Consultants, Incorporated. n.d. Draft Proposed Chinook Salmon Investigations on the Lower American River. In Consultation with the California Department of Fish and Game. Prepared for McDonough, Holland & Allen.
- Beak Consultants Incorporated, TENERA Environmental Services, the California Department of Fish and Game. 1991. Proposed Investigations of the Aquatic Resources in the Lower American River: Phase I. In Association with United States Fish and Wildlife Service, University of California, Davis, and California State University, Sacramento. Submitted December 1990, Revised April 1991.
- Beak Consultants, Incorporated, TENERA Environmental Services, the California Department of Fish and Game. 1990. Draft Proposed Investigations of the Aquatic Resources in the Lower American River.
- Beak Consultants, Incorporated, The State of California Resources Agency, California Department of Fish and Game and Hanson Environmental, Incorporated. 1993. Lower American River Operations and Fisheries Plan. October 1993.
- Beauchamp, D.A., M.F. Shepard, and G.B. Pauley. 1983. Species Profiles: Life histories and environmental requirements of coastal fishes and invertebrates Pacific Northwest, chinook salmon. United States Fish and Wildlife Service Biological Services Program.
- Becker, C.D. 1973. Food and growth parameters of juvenile chinook salmon, *Oncorhynchus tshawytscha*, in central Columbia River. United States Fish and Wildlife Service, Fisheries Research Board, California, 35:69-75.
- Beckman, B.R., D.A. Larsen, B. Lee-Pawlak, and W.W. Dickhoff. 1998. The relation of fish size and growth rate to migration of spring chinook salmon smolts. North American Journal of Fisheries Management 18:537-546.
- Beckman, B.R., W.W. Dickhoff, and W.S. Zaugg. 1999. Growth, Smoltification, and Smolt-to-Adult Return of Spring Chinook Salmon from Hatcheries on the Deschutes River, Oregon. Transactions of the American Fisheries Society 128:1125-1150.
- Beer, W. 1999. Comparison of Mechanistic and Empirical Methods for Modeling Embryo and Alevin Development in Chinook Salmon. North American Journal of Aquaculture, 61:126-134.

- Behnke, J.R. 1982. The Role of Hatcheries in the Management of Wild Salmonids. Proceedings of a Symposium. Department of Fishery and Wildlife Biology, Colorado State University.
- Bell, M. C. 1986. Fisheries handbook of engineering requirements and biological criteria. Fish Passage development and Evaluation Programs, U.S. Army Corps of Engineers, North Pacific Division, Portland, Oregon. 290 pp.
- Bennett, W.A., D.J. Ostrach, and D.E. Hinton. 1990. The nutritional condition of striped bass larvae from the Sacramento-San Joaquin estuary, 1988: an evaluation of the starvation hypothesis using morphometry and histology. A report submitted to Randall Brown, California Department of Water Resources.
- Berggren, T.J. and M.J. Filardo. 1993. An analysis of variables influencing the migration of juvenile salmonids in the Columbia River basin. *North American Journal of Fisheries Management* 13:48-63.
- Bergman, P. K., F. Haw, H. L. Blankenship, and R. M. Buckley. n.d. Perspectives on Design, Use, and Misuse of Fish Tags. *Fisheries* 17:20-25.
- Beringer, D.R. 1991. Bay-Delta Water Quality Control Plan: Response to Comments and Compiled Revision to the Final Draft. State Water Resources Control Board.
- Bern, H. A. 1978. Endocrinological studies on normal and abnormal salmon smoltification. Pages 97-100 in P.J. Gallard and H.H. Boer, editors. *Comparative endocrinology*. Elsevier/North Holland Biomedical Press, Amsterdam.
- Bernard, D.R. 1982. Statewide standards for sampling sizes for AWL Alaska Department of Fish and Game, Sports Fishery Division. Unpublished memorandum.
- Berry, R.J. 1989. Electrophoretic Studies: Perspectives for Population Biology. *In* *Electrophoretic Studies on Agricultural Pests*: H.D. Lodale and J. Den Hollander, editors. Clarendon Press, Oxford.
- Beschta, R.L. 1982. Comment on "Stream system evaluation with emphasis on spawning habitat for salmonids" by M.A. Shirazi and W.K. Seim. *Water Resources Research*, 18:1292-1295.
- Sevenger G.S. and R.M. King. 1995. A pebble count procedure for assessing watershed cumulative effects. United States Forest Service Research Paper RM-RP-319.
- Beyer, J.E. and G.C. Laurence. 1980. A stochastic model of larval fish and growth. *Ecological Modeling*, 8:109-132.
- Bickford, S.A. and J.R. Skalski. 2000. Reanalysis and Interpretation of 25 Years of Snake-Columbia River Juvenile Salmonid Survival Studies. *North American Journal of Fisheries Management*. 20:53-68.
- Billard, C., C. Bry, C. Gillet. n.d. Stress, Environment and Reproduction in Teleost Fish.
- Bilton, H.T. 1984. Returns of chinook salmon in relation to juvenile size at release. Canadian Technical Report of Fisheries and Aquatic Sciences 1245.

- Biosonics. 1990. Technical Report 90-2. Identification of Columbia Basin Sockeye Salmon Stocks Based on Scale Pattern Analyses, 1989. February 20, 1990.
- Biosystems Analysis, Incorporated. 1988. Chinook salmon population model for the Sacramento River basin. Prepared for National Marine Fisheries Service, Habitat Conservation Branch. October 1988.
- Bisson, P.A. 1978. Diet food selection by two sizes of rainbow trout (*Salmo gairdneri*) in an experimental stream. Journal of the Fisheries Research Board of Canada, 35:971-975.
- Bisson, P.A. and G.E. Davis. 1976. Production of juvenile chinook salmon, *Oncorhynchus tshawytscha*, in a heated model stream. Fish Bulletin, 74:763-774.
- Bisson, P.A., J.L. Nielsen, R.A. Palmason, and L.E. Grove. 1982. A system of naming habitat types in a small stream with examples of habitat utilization by salmonids during low streamflow, in Acquisition and Utilization of Aquatic Inventory Information, American Fisheries Society, Western Division.
- Bisson, P.A., K. Sullivan and L.J. Nielson. 1988. Channel hydraulics, habitat use, and body form of juvenile coho salmon, steelhead, and cutthroat trout in streams. Transactions of the American Fisheries Society. 117: 262-273.
- Bjornn, T.C. and C.A. Peery. 1992. A review of literature related to movements of adult salmon and steelhead past dams and through reservoirs in the lower Snake River. U.S. Army Corps of Engineers, Walla Walla, Washington, Technical Report 92-1.
- Bjornn, T. C. and D. W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83-138, in Influences of Forest and Rangeland Management on Salmonid Fishes and their Habitats, W. Meehan, editor. American Fisheries Society Special Publication 19.
- Bjornn, T.C. 1971. Trout and salmon movements in two Idaho streams as related to temperature, food, stream flow, cover and population density. Transactions of the American Fisheries Society, 100(3):423-438.
- Bjornn, T.C. and C.A. Peery. 1992. A review of literature
- Bjornn, T.C., J.P. Hunt, K.P. Tolotti, P.J. Kneiry, and R.R. Ringe. 1994. Migration of adult chinook salmon and steelhead past dams and through reservoirs in the lower Snake River and into tributaries-1992. U.S. Army Corps of Engineers, Walla Walla, Washington.
- Bjornn, T.C., M.A. Brusven, M.P. Molnau, J.H. Milligan, R.A. Klamt, E. Chacho, and C. Schaye. 1977. Transport of granitic sediment in streams and its effects on insects and fish. Forestry Wildlife and Range Experimental Station, Completion Report, Water Resources Research Institute Project. University of Idaho, Moscow, Idaho.
- Slackwell, B., and F. Juanes. 1998. Predation on Atlantic Salmon Smolts by Striped Bass after Dam Passage. North American Journal of Fisheries Management, 18:936-939.
- Boles, G.L., S.M. Turek, C.D. Maxwell, and D.M. McGill. 1988. Water temperature effects on chinook salmon (*Oncorhynchus tshawytscha*) with emphasis on the Sacramento River. Department of Water Resources, Northern District of California.

- Bonneville Power Administration. 1994. Integrated hatchery operations team. Implementation plan for integrating hatchery policies. Bonneville Power Administration, Portland, Oregon.
- Bookman-Edmonston Engineering, Incorporated. 1992. Draft Study Plan. Review of Water Rights on the American River. February 1992.
- Bovee, K.D. 1988. Use of the Instream Flow Incremental Methodology to evaluate influences of microhabitat variability on trout populations in four Colorado streams. Proceedings of the Western Division of the American Fisheries Society. Albuquerque, New Mexico. July 1988.
- Bovee, K.D. 1986. Instream Flow Information Paper 21. Biological Report. Development and evaluation of habitat suitability criteria for use in the instream flow incremental methodology. United States Fish and Wildlife Service.
- Bovee, K.D. 1982. Instream Flow Information Paper No. 12, *FWS/OBS-82/26*. A guide to stream habitat analysis using the instream flow incremental methodology. Cooperative Instream Flow Service Group, Fort Collins, Colorado.
- Bovee, K.D. 1978a. Instream Flow Information Paper 12, *FWS/OBS-78/07*. Probability-of-use criteria for the family *Salmonidae*. United States Fish and Wildlife Service.
- Bovee, K.D. 1978b. The incremental method of assessing habitat potential for cold water species, with management implications. American Fisheries Society Special Publication, 11:340-346.
- Bovee, K.D. and R.T. Milhous. 1978. Hydraulic simulation in instream flow studies: theory and techniques. *FWS/OBS-78/33*. United States Fish and Wildlife Service, Biological Services Program.
- Boydston, L.B., 1990. Evaluation of the Schaefer and Jolly-Seber Methods for Estimating the Fall Chinook Salmon, *Oncorhynchus tshawytscha*, Spawning Run into Bogus Creek, Upper Klamath River, California. California Department of Fish and Game, Inland Fisheries Division.
- Boyle Consulting Engineers, Incorporated. 1989. Sacramento County Water Agency. Water Plan Supplement. 1989.
- Boyle Consulting Engineers, Incorporated. 1987. Sacramento County Water Agency Zone 40 Master Water Supply Plan.
- Bradberry, Carroll E., and Associates. 1959. Water supply for fisheries, Mokelumne River, Camanche Dam to Tidewater. Prepared for the California Department of Fish and Game.
- Bradford, M.J., and G.H. Green. 1992. Growth estimates from otolith increment widths of juvenile chinook salmon (*Oncorhynchus tshawytscha*) reared in changing environments. *Journal of Fish Biology*, 41:825-832.
- Bradford, M.J. and G.H. Green. 1987. Size and growth of juvenile chinook salmon back-calculated from otolith growth increments. Pages 453-461 *in* R.C. Summerfelt and G.E. Hall, editors. The age and growth of fish. Iowa State University Press, Ames, Iowa.

- Braithwaite, Norman S., Incorporated. 1990. Fairbairn Water Treatment Plant Lower American River Bathymetric Survey, Sacramento River Water Intrusion Study. Draft Report.
- Brandt, S.B., D.M. Mason, and E.V. Patrick. 1992. Spatially-explicit Models of Fish Growth Rate. *Fisheries*, 17(2):23-35.
- Bratovich, P.M. 1991. American River Heritage Conference Abstract. California State University, Sacramento, June 1991.
- Brebbia, C.A., and P. Patridge. 1976. Finite element models for circulation studies. Pages 141-159, In C. A. Brebbia, editor. Mathematical models for environmental problems. Pentech Press, London.
- Brett, J.R. 1979. Environmental factors and growth. Pages 599-675, In W.S. Hoar, D.J. Randall, and J.R. Brett, editors, Fish Physiology Bioenergetics and Growth. Volume 8. Academic Press, New York.
- Brett, J.R., 1971. Energetic responses of salmon to temperature: a study of some thermal relations in the physiology and freshwater ecology of sockeye salmon (*Oncorhynchus nerka*). *American Zoology*, 2:99-113.
- Brett, J.R. 1952. Temperature tolerance in young Pacific salmon, genus *Oncorhynchus*. *Journal of the Fisheries Research Board of Canada*, 9:265-325.
- Briggs, J.C. 1953. The behavior and reproduction of salmonid fishes in a small coastal stream. *California Fish and Game Fish Bulletin*. 94. 62 pp.
- Brinson, M.M., F.L. Swift, R.C. Pantico and J.S. Barclay. 1981. Riparian ecosystems: Their ecology and status, OBS-81/17. Eastern Energy and Land Use Team, National Water Resources Analysis Group. United States Fish and Wildlife Service.
- Brockman, R. 1984. Weekly Anadromous Fish Counts at Nimbus Hatchery. United States Bureau of Reclamation. December 2 to December 8, 1984.
- Brockman, R. 1982. Weekly Anadromous Fish Counts at Nimbus Hatchery. United States Bureau of Reclamation. October 24 to October 30, 1982.
- Brockman, R. 1978. Weekly Anadromous Fish Counts at Nimbus Hatchery. United States Bureau of Reclamation. November 26 to December 2, 1978.
- Brockman, R. 1977. Weekly Anadromous Fish Counts at Nimbus Hatchery. United States Bureau of Reclamation. November 6 to November 12, 1977.
- Brockman, R. 1976. Weekly Anadromous Fish Counts at Nimbus Hatchery. United States Bureau of Reclamation. October 24 to October 30, 1976.
- Brockman, R. 1974. Weekly Anadromous Fish Counts at Nimbus Hatchery. United States Bureau of Reclamation. October 20 to October 26, 1974.
- Brodeur, R.D., R.C. Francis, and W.G. Percy. 1992. Food consumption of juvenile coho (*Oncorhynchus kisutch*) and chinook salmon (*Oncorhynchus tshawytscha*) on the continental shelf off Washington and Oregon. *Canadian Journal of Fisheries and Aquatic Sciences*, 49:1670-1685.

- Brothers, E.B. 1985. Otolith marking techniques for the early life history stages of lake trout, Great Lakes Fishery Commission, Research Completion Report, Ann Arbor, Michigan.
- Brothers, E.B. 1981. What can otolith microstructure tell us about daily and sub-daily events in the early life history of fish? *Rapports et Proces-verbaux de Reunions, Conseil International pour l'Exploration de la Mer*, 178:393-394.
- Brown, L.R., and P.B. Moyle. 1991. Changes in habitat and microhabitat partitioning within an assemblage of stream fishes in response to predation by Sacramento squawfish. (*Ptychocheilus grandis*). *Canadian Journal of Fisheries and Aquatic Science*, 48:849-856.
- Brown, L.R., P.B. Moyle, and C.D. Vanicek. 1992. American River Studies: Intensive Fish Surveys, March-June 1991. Department of Wildlife and Fisheries Biology, University of California, Davis, and Department of Biology, California State University-Sacramento. April 1992.
- Brown, R.L. and S. Greene. 1992a. Draft Biological Assessment: Effects of Central Valley Project and State Water Project Delta Operations on Winter-run Chinook Salmon. California Department of Water Resources.
- Brown, R.L. and S. Greene. 1992b. Biological Assessment: Effects of Central Valley Project and State Water Project Delta Operations on Winter-run Chinook Salmon. California Department of Water Resources.
- Brown, R.L. n.d. Screening agricultural diversions in the Sacramento-San Joaquin Delta. California Department of Water Resources.
- Bryant, M.D., B.J. Frenette, and S. J. McCurdy. 1999. Colonization of a Watershed by Anadromous Salmonids following the Installation of a Fish Ladder in Margaret Creek, Southeast Alaska. *North American Journal of Fisheries Management*, 19:1129-1136.
- Buchanan, T.J. and W.P. Somers. 1969. Discharge measurements at gauging stations. Techniques of water resources investigation of the United States Geological Survey.
- Buer, K. 1985. Sacramento River spawning gravel studies, Executive Summary. California Department of Water Resources, Northern District.
- Buer, K. 1984. Middle Sacramento River spawning gravel study. California Department of Water Resources, Northern District.
- Buer, K., J.N. Eaves, R.G. Scott, and J. R. McMillian. 1984. Basin changes affecting salmon habitat in the Sacramento River. California Department of Water Resources.
- Buer, K., R. Scott, D. Parfitt, G. Sen, J. Haney, and L. Thompson. 1981. Salmon spawning enhancement studies on northern California rivers. Pages 149-154 *In*: T.J. Hassler, editor. Proceedings: propagation, enhancement, and rehabilitation of anadromous salmonid populations and habitat in the Pacific Northwest symposium, October 1981. California Cooperative Fishery Research Unit, Arcata.
- Bulow, F.J. 1987. RNA-DNA ratios as indicators of growth in fish: a review. Pages 45-64, *In* R.C. Summerfelt and G.E. Hall, editors. Age and Growth in Fish. Iowa State University Press, Ames, Iowa.

- Burner, C.J. 1951. Characteristics of spawning nests of Columbia River salmon. United States Fish and Wildlife Service. Fish Bulletin, 52:97-110.
- Burns, J.W. 1971. The carrying capacity for juvenile salmonids in some northern California streams. California Department of Fish and Game, 57(1):44-57.
- Burns, J.W. and others. 1975. The Upper Sacramento River – Its Problems and a Plan for its Protection. California Department of Fish and Game.
- Busacker, G.P., I.R. Adelman, and E.M. Goolish. 1990. Growth. *In* C.B. Schreck and P.B. Moyle, editors, Methods in Biology of Fishes. American Fisheries Society Publication, Bethesda, Maryland.
- Cairns, J., Jr., A.G. Heath, and B.C. Parker. 1975. The effects of temperature upon the toxicity of chemicals to aquatic organisms. Hydrobiologia, 47:135-171.
- CALFED Bay-Delta Program. 2000. Ecosystem Restoration Projects and Programs. 2001 Proposal Solicitation Package.
- CALFED Bay-Delta Program. 1999a. Comprehensive Monitoring, Assessment, and Research Program. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.
- CALFED Bay-Delta Program. 1999b. Draft Programmatic Environmental Impact Statement/Environmental Impact Report. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.
- CALFED Bay-Delta Program. 1999c. Ecosystem Restoration Program Plan, Maps. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.
- CALFED Bay-Delta Program. 1999d. Ecosystem Restoration Program Plan, Volume 1— Ecological Attributes of the San Francisco Bay-Delta Watershed. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.
- CALFED Bay-Delta Program. 1999e. Ecosystem Restoration Program Plan, Volume 2— Ecological Management Zone Visions. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine

Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999f. Ecosystem Restoration Program Plan, Strategic Plan for Ecosystem Restoration. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999g. Executive Summary. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service,, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999h. Implementation Plan. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999i. Levee System Integrity Program Plan. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999j. Multi-Species Conservation Strategy. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999k. Revised Phase II Report. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999l. Water Quality Program Plan. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection

Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999m. Water Transfer Program Plan. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999n. Water Use Efficiency Program Plan. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1999o. Watershed Program Plan. Draft Programmatic Environmental Impact Statement/Environmental Impact Report Technical Appendix. Prepared for the United States Bureau of Reclamation, United States Fish and Wildlife Service, National Marine Fisheries Service, United States Environmental Protection Agency, Natural Resources Conservation Service, United States Army Corps of Engineers, and California Resources Agency. June 1999.

CALFED Bay-Delta Program. 1998. Comprehensive Monitoring and Research Program for Fall-Run Chinook Salmon and Steelhead in the San Joaquin River tributaries, the Eastside Rivers, American River, Feather River and the Yuba River. September 30, 1998.

CALFED Bay-Delta Program. 1997. American River Technical Team Meeting Report. Prepared for CALFED Bay-Delta Program Ecosystem Roundtable, Water Forum, Lower American River Task Force. April 4, 1997.

CALFED Bay-Delta Program. 1990. Ecosystem Restoration Program Plan. Ecological Management Zone Visions: Volume 2. June 1999.

California Department of Fish and Game. 2000. Lower American River Pilot Salmon and Steelhead Spawning Habitat Improvement Project. Quarterly Status Report: July 1999-March 2000. Prepared for the U. S. Fish and Wildlife Service Central Valley Anadromous Fish Restoration Program. May 2000.

California Department of Fish and Game. 1999. Central Valley Anadromous Fish – Habitat Evaluations, October 1997 through September 1998. Annual Progress Report. Prepared for the United States Fish and Wildlife Service, Central Valley Anadromous Fish Restoration Program. May 1999.

California Department of Fish and Game. 1997. Central Valley Anadromous Fish Habitat inventory Upper Sacramento River Survey Activities: October, November, and December 1996. Environmental Services Division. Stream Flow and Habitat Evaluation Program. February 1997.

- California Department of Fish and Game. 1996. Instream Evaluation Report and Instream Flow Requirements Lower American River, Sacramento County, California. March 1996.
- California Department of Fish and Game. 1995. Restoring Central Valley Streams: A Plan for Action. February.
- California Department of Fish and Game. 1994a. Critical Evaluation of the Emigration Survey: Lower American River, 1993. Final Report.
- California Department of Fish and Game. 1994b. Review of Juvenile Chinook Salmon Growth Evaluation by Use of Otolith Microstructure Analysis. Memorandum to Lower American River Technical Advisory Committee. April 4, 1994.
- California Department of Fish and Game. 1993a. Factors controlling the abundance of aquatic resources in the Sacramento-San Joaquin Estuary.
- California Department of Fish and Game. 1993b. Hatchery Contribution to the Adult Fall Chinook Salmon Spawning Escapement for the Sacramento-San Joaquin River System. Draft Memorandum to American River File.
- California Department of Fish and Game. 1993c. Stream corridor protection plan. Draft. May 1993.
- California Department of Fish and Game. 1993d. Past trends and present status of selected fish and invertebrate species of the San Francisco Bay/Sacramento-San Joaquin Estuary. Bay-Delta and Special Water Projects Division. Stockton, CA. Prepared for the Bay Delta Oversight Council.
- California Department of Fish and Game. 1992a. A re-examination of factors affecting striped bass abundance in the Sacramento-San Joaquin Estuary. State Water Resources Control Board 1992 Bay-Delta proceedings, Sacramento, California.
- California Department of Fish and Game. 1992b. Draft American River Salmon Escapement Survey, 1992/93 Instructions for Surveyors. September 22, 1992.
- California Department of Fish and Game. 1992c. Impact of water management on splittail in the Sacramento-San Joaquin Estuary. (WRINT-California Department of Fish and Game.) State Water Resources Control Board 1992 Bay-Delta proceedings, Sacramento, California.
- California Department of Fish and Game. 1992d. Interim actions to reasonably protect San Joaquin fall-run chinook salmon. (WRINT-California Department of Fish and Game, Exhibit 25.) Prepared for the Water Rights Phase of the State Water Resources Control Board Bay/Delta Hearing Proceedings, June.
- California Department of Fish and Game. 1992e. Revised and updated estimates of fish entrainment losses associated with the state water project and Federal Central Valley Project facilities in the South Delta. Sacramento, California.
- California Department of Fish and Game. 1992f. San Joaquin River Chinook Salmon Enhancement Project Annual Report Fiscal Year 1990-1991.

- California Department of Fish and Game. 1991a. Lower Mokelumne River Fisheries Management Plan. Stream Flow Requirement Program. November 1991.
- California Department of Fish and Game. 1991b. Lower Yuba River fisheries management plan. Stream Evaluation Report No. 91-1. Sacramento, California.
- California Department of Fish and Game. 1990a. Central Valley Salmon and Steelhead Restoration and Enhancement Plan. April 1990.
- California Department of Fish and Game. 1990b. Determination of habitat preference for upper sacramento River chinook salmon, Project F-51-R, with appendices. Final Report.
- California Department of Fish and Game. 1989. Striped bass restoration and management plan for the Sacramento-San Joaquin Estuary: Phase I.
- California Department of Fish and Game. 1987a. Associations between environmental factors and the abundance and distribution of resident fisheries in the Sacramento-San Joaquin Delta. (California Department of Fish and Game, Exhibit No. 24.) State Water Resources Control Board 1987 water quality/water rights proceeding for the San Francisco Bay/Sacramento-San Joaquin Delta, Sacramento, CA.
- California Department of Fish and Game. 1987b. Estimates of fish entrainment losses associated with the State Water Project and federal Central Valley Project facilities in the south Delta. Final Report. Exhibit No. 17, State Water Resources Control Board 1987 water quality/water rights proceeding for the San Francisco Bay/Sacramento-San Joaquin Delta.
- California Department of Fish and Game. 1987c. Factors affecting striped bass abundance in the Sacramento-San Joaquin system. California Department of Fish and Game, Exhibit No. 25, State Water Resources Control Board 1987 Water Quality/Water Rights Proceeding for the San Francisco Bay/Sacramento-San Joaquin Delta, Sacramento, California; and Technical Report 20, Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary.
- California Department of Fish and Game. 1987d. Requirements of American shad (*Alosa sapidissima*) in the Sacramento-San Joaquin river system. (Department of Fish and Game, Exhibit No. 23.) State Water Resources Control Board 1987 water quality/water rights proceeding for the San Francisco Bay/Sacramento-San Joaquin Delta, Sacramento, CA.)
- California Department of Fish and Game. 1987e. The status of San Joaquin drainage chinook salmon stocks, habitat conditions and natural production factors. (California Department of Fish and Game Exhibit No. 15.) State Water Resources Control Board 1987 water quality/water rights proceeding for the San Francisco/Sacramento/San Joaquin Delta.
- California Department of Fish and Game. 1985. American River Spawning Stock Survey, 1984, with attachment. Memorandum to American River File, Sacramento County. February 5, 1985.
- California Department of Fish and Game. 1984a. 1984 salmon smolt loss at Nevis Industries Diversion Pumps. Memorandum to R.D. Beland, June 18, 1984.

- California Department of Fish and Game. 1984b. American River King Salmon Spawning Stock Report, 1983, with attachment. Memorandum to American River File, Sacramento County. February 28, 1984.
- California Department of Fish and Game. 1984d. California trout, salmon, and warmwater fish production and costs, 1980-1981. Inland Fisheries Branch. Inland Fisheries Administrative Report 84-1.
- California Department of Fish and Game. 1984e. California trout, salmon, and warmwater fish production and costs, 1982-1983. Inland Fisheries Branch. Inland Fisheries Administrative Report 84-4.
- California Department of Fish and Game. 1983. American River King Salmon Spawning Stock Survey, 1982, with attachment. Memorandum to American River File, Sacramento County. January 20, 1983.
- California Department of Fish and Game. 1982a. California trout, salmon, and warmwater fish production and costs, 1979-1980. Inland Fisheries Branch. Inland Fisheries Administrative Report 82-5.
- California Department of Fish and Game. 1982b. Sacramento River and tributaries bank protection and erosion control investigation-evaluation of impacts on fisheries. Final Report. Bay-Delta Fishery Project.
- California Department of Fish and Game. 1982c. The Mokelumne River: Make-do Salmon Management. Memorandum to R. Beland. August, 16, 1982.
- California Department of Fish and Game. 1980. California trout, salmon, and warmwater fish production and costs, 1978-1979. Inland Fisheries Branch. Inland Fisheries Administrative Report 80-1.
- California Department of Fish and Game. 1979. 1979-1980 Daily Salmon Spawning Stock Survey. November 8, 1979.
- California Department of Fish and Game. 1978a. California trout, salmon, and warmwater fish production and costs, 1977-1978. Inland Fisheries Branch.
- California Department of Fish and Game. 1978b. Daily Salmon Spawning Stock Survey (King) on the American River. January 5, 1978.
- California Department of Fish and Game. 1978c. Daily Salmon Spawning Stock Survey (King) on the American River. November 15, 1978.
- California Department of Fish and Game. 1978d. Lower American River Annual Spawning Stock Escapement Estimation Survey Data. 1977-1978.
- California Department of Fish and Game. 1977a. A study of Trinity River steelhead emigration. Anadromous Fisheries Branch Administration Report No. 77-5.
- California Department of Fish and Game. 1977b. Daily Salmon Spawning Stock Survey. November 4, 1977.

- California Department of Fish and Game. 1977c. California trout, salmon, and warmwater fish production and costs, 1976-1977. Inland Fisheries Administrative Report 77-3.
- California Department of Fish and Game. 1976a. 1976 American River King Salmon Spawning Escapement Estimations.
- California Department of fish and Game. 1976b. California trout, salmon, and warmwater fish production and costs, 1975-1976. inland Fisheries Branch. Inland Fisheries Administrative Report 76-5.
- California Department of Fish and Game. 1976c. Lower American River Annual Spawning Stock Escapement Estimation Survey Data. 1975-1976.
- California Department of Fish and Game. 1975a. California trout, salmon, and warmwater fish production and costs, 1974-1975. Inland Fisheries Branch. Inland Fisheries Administrative Report 75-4.
- California Department of Fish and Game. 1975b. California trout, salmon, and warmwater fish production and costs, 1973-1974. Inland Fisheries Branch. Inland Fisheries Administrative Report 75-2.
- California Department of Fish and Game. 1975c. Lower American River Annual Spawning Stock Escapement Estimation Survey Data. 1974-1975.
- California Department of Fish and Game. 1974a. Assessments for federal water projects adversely affecting California's salmon and steelhead resources. Trinity River Division, Central Valley Project.
- California Department of Fish and Game. 1974b. Daily Salmon Spawning Stock Survey. October 31, 1974.
- California Department of Fish and Game. 1974c. California trout, salmon, and warmwater fish production and costs, 1972-1973. Inland Fisheries Branch. Inland Fisheries Administrative Report 74-2.
- California Department of Fish and Game. 1973a. Daily Salmon Spawning Stock Survey on the American River. November 1, 1973.
- California Department of Fish and Game. 1973b. California trout, salmon, and warmwater fish production and costs, 1971-1972. inland Fisheries Branch. Inland Fisheries Administrative Report 73-5.
- California Department of Fish and Game. 1972. Fish and Wildlife Problems and Opportunities in Relation to Sacramento River Water Developments.
- California Department of Fish and Game. 1971. California trout, salmon, and warmwater fish production and costs, 1969-1970. Inland Fisheries Branch. Inland Fisheries Administrative Report 71-8.
- California Department of Fish and Game. 1970. California trout, salmon, and warmwater fish production and costs, 1968-69. Inland Fisheries Branch. Inland Fisheries Administrative Report 70-1.

- California Department of Fish and Game. 1969. California trout, salmon, and warmwater fish production and costs, 1967-68. Inland Fisheries Branch. Inland Fisheries Administrative Report 69-2.
- California Department of Fish and Game. 1968. California trout, salmon, and warmwater fish production and costs, 1966-67. Inland Fisheries Branch. Inland Fisheries Administrative Report 68-1.
- California Department of Fish and Game. 1967. California trout, salmon, and warmwater fish production and costs, 1965-66. Inland Fisheries Branch. Inland Fisheries Administrative Report 67-1.
- California Department of Fish and Game. 1965a. California fish and wildlife plan. Volume 3, Part B.
- California Department of Fish and Game. 1965b. California trout, salmon, and warmwater fish production and costs, 1963-64. Inland Fisheries Branch. Inland Fisheries Administrative Report 65-4.
- California Department of Fish and Game. 1963a. California trout, salmon, and warmwater fish production and costs, 1962-63. Inland Fisheries Administrative Report 63-13.
- California Department of Fish and Game. 1963b. California trout, salmon, and warmwater fish production and costs, 1961-62. Inland Fisheries Branch. Inland Fisheries Administrative Report 63-5.
- California Department of Fish and Game. 1961. California trout, salmon, and warmwater fish production and costs, 1960-61. Inland Fisheries Branch. Inland Fisheries Administrative Report 61-15.
- California Department of Fish and Game. 1960. California trout, salmon, and warmwater fish production and costs, 1959-1960. Inland Fisheries Branch. Inland Fisheries Administrative Report 60-19.
- California Department of Fish and Game. 1956-1990. Annual spawning reports.
- California Department of Fish and Game. 1985. California trout, salmon, and warmwater fish production and costs, 1984-1985. Inland Fisheries Branch. Inland Fisheries Administrative Report.
- California Department of Fish and Game. n.d. Review of Flow Standards in Light of New Evidence and Consideration of Changes. Report of the Special Master, Water Years 1990-1993. Environmental Services Division.
- California Department of Fish and Game. n.d. Trinity River Basin salmon and steelhead monitoring project, 1990-1991 season. Annual report. Inland Fisheries Branch.
- California Department of Fish and Game and Beak Consultants, Incorporated. 1992. Hydraulic Simulation of the Lower American River, Lower American River Fish Habitat Studies.
- California Department of Fish and Game. and United States Bureau of Reclamation. 1987. Agreement between the California Department of Fish and Game and the United States

Bureau of Reclamation regarding interim instream flows and fishery studies in the Stanislaus River below New Melones Dam.

California Department of Water Resources. 1988. Water Temperature Effects on Chinook Salmon (*Oncorhynchus tshawytscha*) with Emphasis on the Sacramento River.

California Department of Water Resources. 1995. San Joaquin River Management Plan. Prepared for the Resources Agency by an Advisory Council Established by Assembly Bill 3603. February 1995.

California Department of Water Resources. 1994a. Comprehensive needs assessment for chinook salmon habitat improvement projects in the San Joaquin River Basin. Prepared for California Department of Fish and Game.

California Department of Water Resources. 1994b. San Joaquin River tributaries spawning gravel assessment: Stanislaus, Tuolumne, and Merced Rivers.

California Department of Water Resources. 1994c. Use of alternate gravel sources for fishery restoration and riparian habitat enhancement, Shasta and Tehama counties, California.

California Department of Water Resources. 1993. Interagency ecological studies program for the Sacramento-San Joaquin Estuary. Compiled by P.L. Herrgesell.

California Department of Water Resources. 1992. Sacramento River spawning gravel restoration: Phase 1.

California Department of Water Resources. 1990. Draft Environmental Impact Report and Environmental Impact Statement, North Delta Program.

California Department of Water Resources. 1989. Upper Sacramento River Fisheries and Riparian Habitat Management Plan.

California Department of Water Resources. 1987. California Central Valley unimpaired flow data. Division of Planning. Second Edition. February 1987.

California Department of Water Resources. 1984. Middle Sacramento River spawning gravel study. Prepared for California Department of Fish and Game.

California Department of Water Resources and California State Resources Agency, California Department of Fish and Game. 1986. Agreement between the Department of Water Resources and the California Department of Fish and Game to offset direct fish losses in relation to the Harvey O. Banks Delta Pumping Plant.

California Department of Water Resources and United States Bureau of Reclamation. 1994. Biological Assessment: Effects of the Central Valley Project and State Water Project on Delta Smelt and Sacramento Splittail. United States Fish and Wildlife Service, Ecological Services, Sacramento Field Office.

California Department of Water Resources and United States Bureau of Reclamation. 1991. Stanislaus River Basin and Calaveras River Water Use Program Scoping Report.

- California Regional Water Quality Control Board. 1991. Winter 1990, 1991 metals lab QA/QC results for aluminum, cadmium, copper, and zinc. Memorandum to C.G. Foe, J.E. Chilcott, B.L. Montoya, V.M. Conner, and R.G. Fastenau. May 6, 1991.
- California Regional Water Quality Control Board. 1975. Water quality control plan report: Sacramento River Basin (5A), Sacramento-San Joaquin Delta Basin (5B), San Joaquin Basin (5C). State Water Resources Control Board, Central Valley Region (5), Volume 1.
- California Regional Water Quality Control Board. 1986. National Pollutant Discharge Elimination System Permit No. CA0004791, Waste Discharge Requirements for Mokelumne River Fish Installation. East Bay Municipal Utility District, The Resources Agency, State of California Department of Fish and Game, San Joaquin County. Order No. 86-042. Central Valley Region.
- California State Resources Agency. 1989. Upper Sacramento River Fisheries and Riparian Habitat Management Plan.
- California State Resources Agency. 1981. Age and Spawning History of American Shad (*Alosa sapidissima*) in Central California, 1975-1978.
- California State University, S.T.L. and E. Heaser. 1984. The American River.
- California State Water Resources Control Board. 1988. Comments to draft lower Mokelumne River Fisheries Study report by Envirosphere Company. Memorandum to Jerry Mensch, California Department of Fish and Game, Region II. August 16, 1988.
- California State Water Resources Control Board. 1987. Technical Report. Lower American River Court reference, Environmental Defense Fund et al. v. East Bay Municipal Utility District.
- California State Water Resources Control Board. 1978. Water quality control plan: Sacramento-San Joaquin and Suisun Marsh.
- California State Water Resources Control Board. 1990. Toxic substances monitoring program: ten year summary reports 1978-1987. (90-1WQ.) August 1990.
- Calkins, R.D., W.F. Durand, and W.H. Rich. 1940. Report of the Board of Consultants on the fish problems of the Upper Sacramento River. Report to the United States Bureau of Reclamation on recommended fish salvage measures associated with the Shasta Dam project. June 21. Stanford University.
- Campana, S.E. 1990. How reliable are growth back-calculations based on otoliths? Canadian Journal of Fisheries and Aquatic Sciences, 47:2219-2227.
- Campana, S.E. 1983. Feeding periodicity and the production of daily growth increments in otoliths of steelhead trout (*Salmo gairdneri*) and starry flounder (*Platichthys stellatus*). Canadian Journal of Zoology, 61:1591-1597.
- Campana, S.E. and J.D. Neilson. 1985. Microstructure of fish otoliths. Canadian Journal of Fisheries and Aquatic Sciences, 42:1014-1032.
- Campbell, R.F., J.H. Neuner and B.R. Eddy. 1984. Verification of habitat utilization criteria for juvenile fall chinook salmon in the North Fork of the Lewis River, Washington. Northwest

Energy Services Company, Bellevue, Washington. Prepared for Pacific Power & Light Company, Portland, Oregon.

Cannon, T.C. 1982. Factors related to the number of striped bass in the Sacramento-San Joaquin Estuary and San Francisco Bay: use and protection. Pages 201-213 *In* Kockelman, W.J., T.J. Conomos, and A.E. Leviton, editors. American Association for the Advancement of Science.

Cannon, T.C. and Envirosphere Company. 1982. Status of the Sacramento-San Joaquin Chinook Salmon and Factors Related to their Decline. Prepared for the National Marine Fisheries Service, Southwest Region.

Carl Mesick Consultants. 1994. The effects of streamflow, water quality, Delta exports, ocean harvest, and El Niño conditions on fall-run chinook salmon escapement in the San Joaquin River drainage from 1951 to 1989. Prepared for The Stanislaus River Council.

Carl, L.M. and M.C. Healey. 1984. Differences in enzyme frequencies and body morphology among three juvenile life history types of chinook salmon (*Oncorhynchus tshawytscha*) in the Nanaimo River, British Columbia. Canadian Special Publications on Fisheries and Aquatic Sciences, 41:1070-1077.

Castlebeny D.T. and M.K. Saiki. 1991. Comments on the letter to Dr. John G. Williams, American River Special Master, dated December 19, 1991, regarding Initial Report of Independent Review Committee, American River Fishery and Aquatic Resource Investigation. United States Fish and Wildlife Service.

Castleberry D.T., M.K. Saiki, and B.A. Martin. 1994. Unpublished Report to East Bay Municipal Utility District. 1994. Field Validation of Daily Increment Formation on the Sagittal Otoliths of Juvenile Chinook Salmon.

Castleberry, D.T. 1993. Otolith Verification Study: A Draft Proposal. March 6, 1993.

Castleberry, D.T. 1992. Effects of Temperature on Growth and Condition of Juvenile Salmonids in the Lower American River. United States Department of the Interior, Fish and Wildlife Service.

Castleberry, D.T., J.J. Cech, Jr., and M.K. Saiki. n.d. Effects of temperature and ration levels on chinook salmon growth and condition in the American River A, Study Plan. United States Fish and Wildlife Service and Department of Wildlife and Fisheries Biology, University of California, Davis.

Castleberry, D.T., J.J. Cech, Jr., M.K. Saiki, and B.A. Martin. 1993. Growth, condition, and physiological performance of juvenile salmonids from the lower American River: February through July, 1992. Final Report. March 1993.

Castleberry, D.T., J.J. Cech, Jr., M.K. Saiki, and B.A. Martin. 1993. Growth, condition, and physiological performance of juvenile salmonids from the lower American River: February through July, 1992. Final Report. United States Fish and Wildlife Service and University of California, Davis.

Castleberry, D.T., J.J. Cech, Jr., M.K. Saiki, and B.A. Martin. 1991. Growth; condition, and physiological performance of juvenile salmonids from the lower American River:

February through June, 1991. Final Report. United States Fish and Wildlife Service and University of California, Davis. December 1, 1991.

- Castleberry, D.T., M.K. Saiki, and B.A. Martin. 1993. Field Validation of Daily Increment Formation on the Sagittal Otoliths of Juvenile Chinook Salmon. Draff Report. United States Fish and Wildlife Service, National Fisheries Contaminant Research Center, Field Research Station – Dixon. November 1, 1993.
- Cech, J.J., Jr. 1994. Environmental Effects on Chinook Salmon Muscle Structure and Development. University of California, Davis.
- Cech, J.J., Jr. 1990. Respirometry *In* C.B. Schreck and P.B. Moyle, editors. Methods in Biology of Fishes. American Fisheries Society Publication, Bethesda, Maryland.
- Cech, J.J., Jr. and C.A. Myrick. 1999. Steelhead and chinook salmon bioenergetics: temperature, ration, and genetic effects. University of California, Davis. Technical Completion Report, Water Resources Center Project No. UCAL-WRC-W-885. August 1999.
- Cech, J.J., Jr., S.G. Campana, and S.J. Mitchell. 1979. Respiratory responses of largemouth bass (*Micropterus salmoides*) to environmental changes in temperature and dissolved oxygen. Transactions of the American Fisheries Society, 108:166-171.
- Cech, J.J., Jr., S.J. Mitchell, and E. Wragg. 1984. Comparative growth of juvenile white sturgeon and striped bass: effects of temperature and hypoxia. Estuaries, 7:12-18.
- Cech, J.J., Jr., S.J. Mitchell, D.T. Castleberry, and M. McEnroe. 1990. Distribution of California stream fishes: influence of environmental temperature and, hypoxia. Environmental Biology of Fishes, 29:95-105.
- Center for Environmental and Water Resources Engineering. 1997. Sacramento River Temperature Modeling Project. Department of Civil and Environmental Engineering Modeling Group, University of California, Davis. Report No. 97-01.. Sponsored by the State Water Resources Control Board, the Trinity County Planning Department, and the California Department of Fish and Game. January 1997.
- CH2M Hill. 1992. Conceptual Design Report. Butte Creek Siphon. Prepared for Western Canal Water District.
- CH2M Hill. 1985. Klamath River Basin Fisheries Resource Plan. Prepared for United States Bureau of Reclamation.
- Chadwick, C. 1994. Consideration of possible changes in flow standards. Letter to John G. Williams. California Department of Fish and Game. October 14, 1994.
- Chadwick, H.K. 1967. Recent migrations of the Sacramento-San Joaquin River striped bass populations. Transactions of the American Fisheries Society, 96(3):327-342.
- Chadwick, P. 1993. Factors controlling the abundance of aquatic resources in the Sacramento-San Joaquin estuary. Draff Report. California Department of Fish and Game.
- Chambers, J.S., R.T. Pressey, J.R. Donaldson, and W.R. McKinley. 1954. Research relating to study of spawning grounds in natural areas. State of Washington, Department of

Fisheries. Olympia, Washington. Annual Report to the United States Army Corps of Engineers.

Chambers, J.S. 1956. Progress Report No. 5. Research relating to study of spawning grounds in natural areas. Fish Passage Development and Evaluation Program. United States Army Corps of Engineers, North Pacific Division, Portland, Oregon.

Chapman, D.W., D.E. Weitkamp, T.L. Welsh, M.B. Bell, and T.H. Schadt. 1986. Effects of river flow on the distribution of chinook salmon redds. *Transactions of the American Fisheries Society*, 115:537-547.

Chapman, D.W. 1992. Comments on plans for management of fisheries of the lower Mokelumne River. Submitted to California State Water Resources Control Board.

Chapman, D.W. 1988. Critical review of variables used to define effects of fines in redds of large salmonids. *Transactions of the American Fisheries Society*, 117(1):1-21.

Chapman, D.W. 1966. Food and space as regulators of salmonid populations in streams. *American Naturalist*, 100(913):345-357.

Chapman, D.W. 1962. General Technical Report **PNW-96**. Effects of logging upon fish resources of the west coast. *Journal of Forestry*, 60(8):533-537. In D.W. Reiser and T.C. Bjornn, 1979. Habitat requirements of anadromous salmonids. United States Department of Agriculture, Forest Service.

Chapman, D.W., and T.C. Bjornn. 1969. Distribution of salmonids in streams, with special reference to food and feeding. pp. 153-176, In T.G. Northcote, editor. Symposium on salmon and trout in streams. Institute of Fisheries, University of British Columbia. Vancouver, Canada.

Chapman, W.M. 1943. The spawning of chinook salmon in the main Columbia River. *Copeia*, 168-170.

Chatfield, C. 1984. The analysis of time series: An introduction. LW. Arrowsmith, Ltd.

Cheslak, E.F. and A.S. Jacobson: 1990. Integrating the Instream Flow Incremental Methodology with a population response model. *Rivers*, 1:264-288.

Christiansen, L.B. and United States Bureau of Reclamation. 1981. Central Valley Project. Its Historical Background and Economic Impacts.

Church, M.A., D.G. McLean, and F.J. Wolcott. 1987. River bed gravels: sampling and analysis. Sediment Transport in Gravel Bed Rivers. Pages 43-79, In C.W. Thorne, et al., editors. John Wiley and Sons, England.

City of Sacramento. 1993. Notice of Preparation for Central Valley Project Water Supply Contracts.

City of Sacramento and County of Sacramento. 1999.a. Draft Environmental Impact Report for the Water Forum Proposal. Prepared for Sacramento City-County Office of Metropolitan Water Planning. January 1999.

- City of Sacramento and County of Sacramento. 1999b. Executive Summary to the Final Environmental Impact Report for the Water Forum Proposal. Prepared for Sacramento City-County Office of Metropolitan Water Planning. October 1999.
- City of Sacramento and County of Sacramento. 1999c. Final Environmental Impact Report for the Water Forum Proposal. Prepared for Sacramento City-County Office of Metropolitan Water Planning. October 1999.
- City of Sacramento and County of Sacramento. 1997. Habitat Mitigation Element of the Water Forum Agreement: A Component of a Multi-Agency, Lower American River Habitat Management Program. Prepared for Sacramento City-County Office of Metropolitan Water Planning.
- City of Sacramento and County of Sacramento. 1992. City-County Office of Metropolitan Water Planning Work Plan.
- Clark, G.H. 1929. Sacramento-San Joaquin salmon (*Oncorhynchus tshawytscha*) fishery of California. California Department of Fish and Game. Fish Bulletin No. 17.
- Clarke, W.C. and J. Blackburn. 1978. Seawater challenge tests performed on hatchery stocks of chinook and coho salmon in 1977. Canada Fisheries Marine Service. Technical Report 761.
- Clarke, W.C. and J. Blackburn. 1977. A seawater challenge test to measure smolting of juvenile salmon. Canada Fisheries Marine Service. Technical Report .
- Clarke, W.C. and J.E. Shelbourn. 1985. Growth and development of seawater adaptability by juvenile salmon *Oncorhynchus tshawytscha* in relation to temperature. *Aquaculture*, 45:21-31.
- Clarke, W.C., J.E. Shelbourn, and J.R. Brett. 1981. Effect of artificial photoperiod cycles, temperature, and salinity on growth and smolting in underyearling coho (*Oncorhynchus kisutch*), chinook (*Oncorhynchus tshawytscha*), and sockeye (*Oncorhynchus nerka*) salmon. *Aquaculture*, 22:105-116.
- Cobel, D. W. 1961. Influence of water exchange and dissolved oxygen in redds on survival of steelhead trout embryos. *Transactions of the American Fisheries Society*, 90:469-474.
- Cochran, W.G. 1977. Sampling Techniques. John Wiley & Sons. New York.
- Collins, B.W. 1981. Growth of adult striped bass in the Sacramento-San Joaquin estuary. California Department of Fish and Game, 68(3):146-159.
- Combs, B.D. 1965. Effect of temperature on the development of salmon eggs. *Progressive Fish-Culturist*, 27(3):134-137.
- Combs, B.D., and R.E. Burrows. 1957. Threshold temperatures for the normal development of chinook salmon eggs. *Progressive Fish-Culturist*, 19(1): 3-6.
- Conard, S.G., R.L. McDonald and R.F. Holland. 1977. Riparian vegetation and flora of the Sacramento Valley. In: A. Sands, editor. *Riparian forests of California: Their ecology and Conservation*. Institute of Ecology Publication No. 15. University of California, Davis.

- Condor, A.L., and T.C. Annear. 1987. Test of weighted useable area estimates derived from a PHABSIM model for instream flow studies on trout streams. *North American Journal of Fisheries Management*, 7(3):339-350.
- Conte, F.P., and H.H. Wagner. 1965. Development of osmotic and ionic regulation in juvenile steelhead trout *Salmo gairdneri*. *Comprehensive Biochemistry Physiology*, 14:603-620.
- Cook, L. 1995. Status Report on Screw Traps. Letter with attachments to Mr. John Myers - East Bay Municipal Utility District. California Department of Fish and Game. June 5, 1995.
- County of Sacramento and California Department of Fish and Game. 1991. Agreement to Conduct Fish Investigations in the Lower American River, Sacramento County. February 1991.
- County of Sacramento and EIP Associates. 1992. Sacramento County General Plan Update Draft Environmental Impact Report. Department of Environmental Review and Assessment.
- County of Sacramento. 1998. Comments on Draft Environmental Impact Statement/Draft Environmental Impact Report for the East Bay Municipal Utility District Supplemental Water Supply Project. Letter to Messrs. Ladensack and Lesley. March 19, 1998.
- County of Sacramento. 1993a. Notice of Preparation to Prepare a Draft Environmental Impact Report/Notice of Intent to Prepare a Draft Environmental Impact Statement for Sacramento County Water Agency and the San Juan Suburban Water District. Central Valley Project Water Service Contracts.
- County of Sacramento. 1993b. Sacramento County Water Policy Statement (August 10, 1993) Department of Public Works.
- County of Sacramento. 1993c. Sacramento County Water Policy Statement (June 15, 1993) Department of Public Works.
- County of Sacramento. 1985. American River Parkway Plan.
- Coutant, C.C. 1973. Effect of thermal shock on vulnerability of juvenile salmonids to predation. *Journal of the Fisheries Research Board of Canada*, 30:765-973.
- Craddock, D.R. 1961. An Improved Trap for the Capture and Safe Retention of Salmon Smolts.
- Craddock, D.R. 1959. A Modified Fyke Net for the Live Capture of Seaward-Migrating Salmon.
- Cramer and Associates. 1990. Survival of juvenile chinook at the Glenn-Colusa Irrigation District's intake. Progress Report. April-July 1990. Corvallis, Oregon. Prepared for Glenn-Colusa Irrigation District.
- Cramer, S.P. 1990. Contribution of Sacramento Basin Hatcheries to Ocean Catch and River Escapement of Fall Chinook Salmon. Corvallis, OR. Prepared for the California Department of Water Resources, Sacramento, CA.

- Crisp, D.T. 1981. A desk study of the relationship between temperature and hatching time for the eggs of five species of salmonid fishes. *Freshwater Biology*, 11(4):36-358.
- Crisp, D.T. and P.A. Carling. 1989. Observations on siting, dimensions and structure of salmonid redds. *Journal of Fish Biology*, 34:119-134.
- Cushman, R.M. 1985. Review of Ecological Effects of Rapidly Varying Flows Downstream from Hydroelectric Facilities. *North American Journal of Fisheries Management*, 5:330-339.
- D.W. Kelley & Associates. 1987a. Juvenile chinook populations during 1987 spring low flow and high temperature conditions in the lower American River. December 1987.
- D.W. Kelley & Associates. 1987b. Migrations of adult striped bass in the Sacramento-San Joaquin estuary in relation to water temperature with emphasis on the thermal niche hypothesis. Prepared for California Department of Water Resources.
- D.W. Kelley & Associates. 1987c. Spring Water Temperatures of the Sacramento River.
- D.W. Kelley & Associates. 1987d. The influence of flow on Central Valley salmon. Prepared for California Department of Water Resources.
- D.W. Kelley & Associates. 1987e. The roles of Feather and Nimbus salmon and steelhead hatcheries and natural reproduction in supporting fall run chinook salmon populations in the Sacramento River Basin. Prepared for California Department of Water Resources.
- D.W. Kelley & Associates. 1985. The Effects of Streamflow on Fish in the Lower American River. Prepared for East Bay Municipal Utility District.
- Daniels, R.A. and P.B. Moyle. 1983. Life history of splittail (*Pogonichthys macrolepidotus*) in the Sacramento-San Joaquin estuary. *Fish Bulletin*, 81(3):647-654.
- Dauble, D.D. and R.P. Mueller. 1993. Factors affecting the survival of upstream migrant adult salmonids in the Columbia River basin. Recovery issues for threatened and endangered Snake River salmon. Bonneville Power Administration. Technical Report 9. Portland, Oregon.
- Dauble, D.D. and D.G. Watson. 1997. Status of fall chinook salmon populations in the mid-Columbia River, 1948-1992. *North American Journal of Fisheries Management*, 17:283-300.
- Dauble, D.D., R.L. Johnson and A.P. Garcia. 1999. Fall chinook salmon spawning in the tailraces of lower Snake River hydroelectric projects. *Transactions of the American Fisheries Society*, 128:672-679.
- Davie, P.S., R.M. G. Wells and V. Tetens. 1986. Effects of sustained swimming on rainbow trout muscle structure, blood oxygen transport, and lactate dehydrogenase isozymes: evidence for increased aerobic capacity of white muscle. *Journal of Experimental Zoology*, 237:159-171.
- Davis, G.E. 1974. Phase II: Temperature requirements of salmonids in relation to their feeding, bioenergetics, growth, and behavior. Summary Progress Report. Department Fish and Wildlife, Oregon State University, Corvallis, Oregon.

- Davis, G.E., J. Forster, C.E. Warren, and P. Doudoroff. 1963. The influence of oxygen concentration on the swimming performance of juvenile Pacific salmon at various temperatures. *Transactions of the American Fisheries Society*, 92:111-124.
- Davis, J.C. 1975. General Technical Report PNW-96. Minimal dissolved oxygen requirements of aquatic life with emphasis on Canadian species: A Review. *Journal of the Fisheries Research Board of Canada*, 32(12):2295-2332. *In* D.W. Reiser and T.C. Bjornn. 1979. Habitat requirements of anadromous salmonids. United States Department of Agriculture, Forest Service.
- Davis, N.D. 1987. Report FRI-UW-8713. Document submitted to annual meeting of the International North Pacifica. Variable selection and performance of variable subsets in scale pattern analysis. Fisheries Commission 1987. Fisheries Research Institute, University of Washington,
- Davis, S.K., J.L. Congleton, and R.W. Tyler. 1980. Modified Fyke net for the capture and retention of salmon smolts in large rivers. *Progressive Fish-Culturist*, 42:235:237.
- Davison, W. and G. Goldspink. 1977. The effect of prolonged exercise on the lateral musculature of the brown trout (*Salmo trutta*). *Journal of Experimental Biology* 70:1-12.
- De Cuir & Somach. 1998. Comments on the Draft Environmental Impact Report/Draft Environmental Impact Statement for the East Bay Municipal Utility District Proposed Supplemental Water Supply Project. Letter to Kurt Ladensack, East Bay Municipal Utility District. March 19, 1998.
- De Cuir & Somach. 1996. Comments on East Bay Municipal Utility District's Notice of Preparation and Initial Study for the Folsom South Canal Connection Project Environmental Impact Report. Letter to East Bay Municipal Utility District. February 29, 1996.
- De Cuir & Somach. 1995. Review of the Environmental Defense Fund v. East Bay Municipal Utility District: Report of the Special Master, Water Years 1990-1993. Fax transmittal to Beak Consultants, Incorporated. April 19, 1995.
- De Cuir & Somach. 1993. Report for Updated Water Supply Management Program. Comments on Draft Environmental Impact Statement/Draft Environmental Impact. Letter to East Bay Municipal Utility District. March 12, 1993.
- Debouzie, D., and J. Thioulouse. 1986. Statistics to find spatial and temporal structures in populations. *In* M. Mangel, J.R. Carey, and R. Plant, editors. *Pest Control: Operations and Systems Analysis in Fruit Fly Management* Springer-Verlag, Heidelberg. 263-282.
- DeHaven, R.W. 2000. Impacts Of Bank Protection To Ecosystem Functioning, Lower Sacramento River, California. United States Fish and Wildlife Service, Sacramento, California.
- DeHaven, R.W. 1999. Impacts Of Bank Protection To Ecosystem Functioning, Lower Sacramento River, California. Draft Report. United States Fish and Wildlife Service, Sacramento, California. December 1999.

- DeHaven, R.W. 1977. Annual Progress Report No. 2. An angling study of striped bass ecology in the American and Feather rivers, California.
- DeHaven, R.W., and M.B. Fris. 1993. Pre-construction Fishery Sampling Results at Three Experimental Dredge - Berm Mitigation Features, Lower Sacramento River, California, 1989-1991; Post-construction Monitoring Results at Three Experimental Dredge - Berm Mitigation Structures, Lower American River, California, 1991-1992.
- Dendy, B.A. 1994. Water Supplies vs. Water Needs in the City of Sacramento's American River Water Rights Place of Use.
- Denton, D.N. 1986. Clear Creek Fishery Study. California Department of Water Resources, Northern District.
- Department of Planning and Development, City of Sacramento. 1985. American River Parkway Plan.
- Dettman, D.H. 1977. Habitat selection, daytime behavior and factors influencing distribution and abundance of rainbow trout (*Salmo gairdneri*) and Sacramento squawfish (*Ptychocheilus grandis*) in Deer Creek, California. Master's Thesis. University of California, Davis.
- DeVries, P. 1997. Riverine salmonid egg burial depths: review of published data and implications for scour studies. Canadian Journal of Fisheries and Aquatic Sciences 54:1685-1698.
- Dickhoff, W.W. n.d. Smolt Quality Assessment of Spring Chinook Salmon.
- Diemer, D.M. 1999. East Bay Municipal Utility District/Sacramento Joint Project - Response to January 25 Letter. Letter to Robert Ryan, County of Sacramento. East Bay Municipal Utility District. February 9, 1999.
- Diemer, D.M. 1997. Lower Mokelumne River Project - Project No. 2916-004. Joint Settlement Agreement. Letter to Federal Energy Regulatory Commission. East Bay Municipal Utility District. June 26, 1997.
- Dill, L.M. 1987. Animal decision making and its ecological consequences: the future of aquatic ecology and behavior. Canadian Journal of Zoology, 65:803-811.
- Dodjin, M. 1989. Upper Sacramento River Fisheries/Riparian Habitat Management Plan. Fisheries Part. January 1989.
- Donaldson, J.R. 1955. Experimental studies on the survival of the early stages of chinook salmon after varying exposures to upper lethal temperatures. Master's Thesis. University of Washington, Seattle, Washington.
- DuBois, R.B., Miller, J.E., and S.D. Plaster. 1991. An inclined-screen smolt trap with adjustable screen for highly variable flows. North American Journal of Fisheries Management, 11:155-159.
- Ducey, R.D. 1989. Testimony transcripts from Environmental Defense Fund, Inc., et al, vs. East Bay Municipal Utility District, et al. Superior Court of the State of California in and for the County of Alameda before the Honorable Richard A. Hodge. March 27, 1989.

- Ducey, R.D. 1988. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1987-88. California Department of Fish and Game.
- Ducey, R.D. 1987. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1986-87. California Department of Fish and Game.
- Ducey, R.D. 1986. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1985-86. California Department of Fish and Game.
- Ducey, R.D. 1985. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1984-85. California Department of Fish and Game.
- Ducey, R.D. 1983. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1982-83. California Department of Fish and Game.
- Ducey, R.D. 1984. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1983-84. California Department of Fish and Game.
- Dunn, P.L. 1990. Chinook Salmon Redd Dewatering Analyses on the American River, 1990. Jones & Stokes Associates.
- DuPraw, M.E. 2000. Development of a Fisheries and Aquatic Habitat Management Plan for the Lower American River. Draft Convening Report. February 14, 2000.
- E.A. Engineering, Science and Technology, Incorporated. 1992. An evaluation of the effect of gravel ripping on redd distribution in the lower Tuolumne River. Appendix 11 *in* Don Pedro Project Fisheries Study Report. Federal Energy Regulatory Commission Article 39, Project No. 2299. Prepared for Turlock Irrigation District and Modesto Irrigation District.
- E.A. Engineering, Science and Technology, Incorporated. 1992. Lower Tuolumne River Spawning Gravel Availability and Superimposition. Appendix 6 *in* Don Pedro Project Fisheries Study Report. Federal Energy Regulatory Commission. Article 39, Project No. 2299. February 4, 1992. Prepared for Turlock Irrigation District and Modesto Irrigation District.
- E.A. Engineering, Science and Technology, Incorporated. 1992. Stock-Recruitment Analysis of the Population Dynamics of San Joaquin River System Chinook Salmon. Appendix 2 *in* Don Pedro Project Fisheries Study Report. Federal Energy Regulatory Commission. Article 39, Project No. 2299. Prepared for Turlock Irrigation District and Modesto Irrigation District.
- E.A. Engineering, Science and Technology, Incorporated. 1991. San Joaquin River System Chinook Salmon Population Model Documentation and Validation. Appendix 1 *in* Don Pedro Project Fisheries Study Report. Federal Energy Regulatory Commission. Article 39, Project No. 2299. Prepared for Turlock Irrigation District and Modesto Irrigation District.
- E.A. Engineering, Science and Technology, Incorporated. 1991. Lower Tuolumne River Predation Study Report. Appendix 22 *in* Don Pedro Project Fisheries Study Report. Federal Energy Regulatory Commission. Article 39, Project No. 2299. Prepared for Turlock Irrigation District and Modesto Irrigation District.

- E.A. Engineering, Science and Technology, Incorporated. 1991. San Joaquin River system chinook salmon population model documentation. Prepared for Turlock Irrigation District and Modesto Irrigation District.
- E.A. Engineering, Science and Technology, Incorporated. 1990. Integrating the Instream Flow Incremental Methodology with a Population Response Model.
- E.A. Engineering, Science and Technology, Incorporated. 1989. Clavey River Project. Report 3. Fish, Wildlife, and Botanical Resources. Final Report. 10367.10. Prepared for Tuolumne County and Turlock Irrigation District.
- E.A. Engineering, Science and Technology, Incorporated. 1989. San Joaquin River system chinook salmon population model documentation. Draft. Prepared for Turlock Irrigation District and Modesto Irrigation District.
- E.A. Engineering, Science and Technology, Incorporated. 1985. Exhibit R, Recreation Plan, Upper American River Project. Federal Energy Regulatory Commission. Project No. 2101. Prepared for the Sacramento Municipal Utility District.
- E.G. Solutions. n.d. Rotary Screw Fish Collector.
- East Bay Municipal Utility District. 1999. Statement of the East Bay Municipal Utility District Board of Directors and Direction to Staff Regarding Sacramento Parties American River Project Proposal.
- East Bay Municipal Utility District. 1996. Notice of Preparation and Notice of Scoping Meetings for the Folsom South Canal Connection Project, Environmental Impact Report. January 25, 1996.
- East Bay Municipal Utility District. 1994. Major limiting factors affecting salmon and steelhead production in the lower Mokelumne River (1967-1991) and options for restoration. Draft report.
- East Bay Municipal Utility District. 1991. Proposed Investigations of the Aquatic Resources in the Lower American River: Phase 1. Draft. East Bay Municipal Utility District's Comments on the Recently Revised Study Component 3 - Fish Physiology. January 2, 1991.
- East Bay Municipal Utility District. 1989. Water Supply Management Program. Final Environmental Impact Report.
- EDAW, Incorporated and Biosystems Analysis. 1992. Updated Water Supply Management Program. Draft Environmental Impact Statement/Environmental Impact Report.
- Eddy, R.M. 1972. The influence of dissolved oxygen concentration and temperature on the survival and growth of chinook salmon embryos and fry. Master's Thesis. Department of Fisheries and Wildlife, Oregon State University. June 1972.
- Edmundson, E.H., F.H. Everest and D.W. Chapman. 1968. Permanence of station in juvenile chinook salmon and steelhead trout. Journal of the Fisheries Research Board of Canada, 25:1453-1464.

- Edwards, E.A., D. Krieger, G. Gebhard, and O.E. Maughan. 1982. Habitat suitability index models: white crappie. United States Fish and Wildlife Service, Office of Biological Services, Western Energy and Land Use Team.
- Eldridge, M.B., J.A. Whipple, D. Eng, M.J. Bowers, and B.M. Jarvis. 1981. Effects of food and feeding factors on laboratory-reared striped bass larvae. Transactions of the American Fisheries Society. 110:111-120.
- Elliott, J.M. 1982. The effects of temperature and ration size on the growth and energetics of salmonids in captivity. Comparative Biochemistry and Physiology, 73B:81-91.
- Elliott, J.M. 1977. Some methods for the statistical analysis of samples of benthic invertebrates. Freshwater Biological Association. Scientific Publication No. 25.
- Elliot, J.M. 1976. The energetics of feeding, metabolism, and growth of brown trout (*Salmo trutta* L.) in relation to body weight, water temperature, and ration size. Journal of Animal Ecology, 45:923-948.
- Elliot, J.M. 1975. The growth rate of brown trout (*Salmo trutta* L.) fed on maximum rations. Journal of Animal Ecology, 44:805-821.
- Elliott, J.M. 1973. The food of brown and rainbow trout (*Salmo trutta* and *Salmo gairdner*) in relation to the abundance of driving invertebrates in a mountain stream. Oecologia Berlin, 12:329-347.
- Elliott, J.M. and W. Davison. 1975. Energy equivalents of oxygen consumption in animal energetics. Oecologia Berlin, 19:195-201.
- Eng, L.L. 1984. Rare, threatened, and endangered invertebrates in California riparian systems. In R.E. Warner and K.M. Hendrix, editors. Proceedings of the California riparian systems conference. University of California, Davis, September 17-19, 1981.
- ENTRIX. 1993. Response of fish populations to altered flows project macroinvertebrates. Progress Report to Southern California Edison Company. Rosemead, California.
- Envirosphere Company. 1988. Inland Fisheries Administrative Report No. 89-3. Annual report Mokelumne River Hatchery, 1987-88. California Department of Fish and Game.
- Ettema, R. 1984. Sampling armor-layer sediments. Journal of Hydraulic Engineering, American Society of Civil Engineers. 10:992-997.
- Everest, F.H., and D.W. Chapman. 1972. Habitat selection and spatial interaction by juvenile chinook salmon and steelhead trout in two Idaho streams. Journal of the Fisheries Resources Board of Canada, 29:91-100.
- Ewing, R.D., S.L. Johnson, H.J. Pribble, and J.A. Lichatowich. 1979. Temperature and photoperiod effects on gill Na and K ATPase activity in chinook salmon (*Oncorhynchus tshawytscha*). Journal of the Fisheries Research Board Canada, 36:1347-1353.
- Expert Review Panel. 1993. Expert Review Panel Comments and Recommendations. American River Fisheries Research. February 1, 1993.

- Expert Review Panel. 1992. Expert Review Panel Comments and Recommendations. American River Fisheries Research. September 3, 1992.
- Facey, D.E., and G.D. Grossman. 1992. The relationship between water velocity, energetic costs, and microhabitat use on four North American stream fishes. *Hydrobiologia*, 239:1-6.
- Farley, T.C. 1966. Striped Bass, *Roccus saxatilis*, spawning in the Sacramento-San Joaquin River systems during 1963 and 1964. Pages, 28-43 in J.L. Turner and D.W. Kelley (Comprehensive) Ecological studies of the Sacramento-San Joaquin Delta, Part II, Fishes of the Delta, California Department of Fish and Game. Fish Bulletin.
- Fausch, K.D. 1984. Profitable stream positions for salmonids: relating specific growth rate to net energy gain. *Canadian Journal of Zoology*, 62:441-451.
- Federal Energy Regulatory Commission. 1993. Proposed modifications to the Lower Mokelumne River Project, California. Final Environmental Impact Report.
- Feldmeth, C.R. and T.M. Jenkins, Jr. 1973. An estimate of energy expenditure by rainbow trout (*Salmogairdneri*) in a small mountain stream. *Journal of the Fisheries Research Board of Canada*, 30:1755-1759.
- Ferguson, M.M. and R.G. Danzmann. 1990. RNA and DNA ratios in white muscles as estimates of growth in rainbow trout held at different temperatures. *Canadian Journal of Zoology*, 68:1494-1498.
- Finlayson, B.J. and H.J. Rectenwald. 1978. Toxicity of copper and zinc from the Penn Mine area on king salmon (*Oncorhynchus tshawytscha*) and steelhead trout (*Salmo gairdneri*) in the Mokelumne River Basin, California. California Department of Fish and Game. Branch Administrative Report No. 78-1.
- Fisher, C.K. 1979. No guarantees for minimum water flows for fish and wildlife. *Outdoor California*, 40(4):10-11.
- Fisher, F.W. 1976. Limited evaluation of the Woodbridge Irrigation District Fish Screen. California Department of Fish and Game. Anadromous Fisheries Branch. Administrative Report No. 76-10.
- Fjelstad, M. 1992. American River Chinook Salmon Escapement, 1991. Memorandum to American River File, Sacramento County. California Department of Fish and Game. March 23, 1992.
- Foe, C. 1995. Diazinon pulses in the Sacramento and San Joaquin rivers. *Water Quality News California Department of Water Resources*. Winter 1995.
- Fothergill, K.R. 1994. Lower American River Emigration Survey; 1993. Final Report. California Department of Fish and Game. August 1994.
- Fredericksen, Kamine and Associates. 1980. Proposed Trinity River Basin Fish and Wildlife Management Program. Final Summary Report, Contract No. 8-07-02-VOO35. Prepared for the United States Department of Interior, Water and Power Resources Service.

- Freeman, M.C., M.K. Crawford, J.C., Barrett, D.E. Facey, M.G. Flood, J. Hill, D.J. Stouder, and G.D. Grossman. 1988. Fish assemblage stability in a southern Appalachian stream. *Canadian Journal of Fisheries and Aquatic Sciences*, 45: 1949-1958.
- Fris, M.B. and R.W. DeHaven. 1993. A community-based habitat suitability model for shaded riverine aquatic cover, selected reaches of the Sacramento River system. Draft Report. United States Fish and Wildlife Service, Sacramento, California. February 1993.
- Friesen, T.A. and D.L. Ward. 1999. Management of Northern Pikeminnow and Implications for Juvenile Salmonid Survival in the Lower Columbia and Snake Rivers. *North American Journal of Fisheries Management*, 19:406-420.
- Frissel, C.A., W.J. Liss, C.E. Warren, and M.D. Hurley. 1986. A hierarchical framework for stream classification: viewing streams in a watershed context. *Environmental Management*, 10:199-214.
- Fry, D.H., Jr. 1961. King salmon spawning stocks of the California Central Valley, 1940-1959. *California Department of Fish and Game*, 47(1):55-71.
- Fry, F.E.J. 1971. The effect of environmental factors on the physiology of fish. Pages 1-98, in W.S. Hoar and D.J. Randall, editors. *Fish Psychology*. Volume 6. Academic Press, New York and London.
- Frye, R. 1983. Climatic change and fisheries management. *Natural Resources Journal*, 23:77-96.
- Fujimura, R.W. 1991. Observations on temporal and spatial variability of striped bass eggs and larvae and their food in the Sacramento-San Joaquin River system. Technical Report 27, Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary. California Department of Fish and Game.
- Gaines, D. 1976. Abstracts from the conference on the riparian forests of the Sacramento Valley. Chico, California. Sponsored by Davis and Altacal Audubon Society. May 22, 1976.
- Gan, K. and T. McMahon. 1990. Variability of results from the use of PHABISM in estimating habitat area. *Regulated Rivers*, 5:233-239.
- Gangmark, H.A., and R.D. Broad. 1956. Further observations on stream survival of king salmon spawn. *California Department of Fish and Game*, 42:37-39.
- Gangmark, H.A., and R.D. Broad. 1955. Experimental hatching of king salmon in Mill Creek, a tributary to the Sacramento River. *California Department of Fish and Game*, 44:233-242.
- Gangmark, H.A., and R.G. Bakkala. 1960. A comparative study of stable and unstable artificial channel spawning streams for incubating king salmon at Mill Creek. *California Department of Fish and Game*, 46:151-164.
- Gangmark, H.A., and R.G. Bakkala. 1958. Plastic standpipe for sampling stream bed environment of salmon spawn. United States Fish and Wildlife Service, Special Scientific Report Fisheries No. 261.

- Garling, D.L. and M. Masterton. 1985. Survival of Lake Michigan chinook salmon eggs and fry incubated at three temperatures. *Progressive Fish-Culturist*, 47(1):63-66.
- Gatz, A.J., Jr. 1981. Morphologically inferred niche differentiation in stream fishes. *American Midland Naturalist*, 160:10-21.
- Geffen, A.J. 1987. Methods of validating daily increment deposition in otoliths of larval fish. Pages 223-240, *In* R.C. Summerfelt and G.E. Hall, editors. *The age and growth of fish*. Iowa State University Press, Ames, Iowa.
- Geist, D.R., C.S. Abernathy, S.L. Blanton, and V.I. Cullinen. 2000. The use of electromyogram telemetry to estimate energy expenditure of adult fall chinook salmon. *Transactions of the American Fisheries Society*, 129:126-135.
- Gerstung, E. 1971. Fish and Wildlife Resources of the American River to be affected by the Auburn Dam and Reservoir and the Folsom South Canal, and measures proposed to maintain these resources. California Department of Fish and Game.
- Gervais, R. 1974. Mokelumne River. *In* S.N. Taylor, editor. 1974. Chinook (king) salmon spawning stocks in California's Central Valley, 1972. California Department of Fish and Game. Anadromous Fisheries Branch Administrative Report No. 74-6.
- Gervais, R. 1973. Mokelumne River. *In* S.N. Taylor, editor. 1973. King (chinook) salmon spawning stocks in California's Central Valley, 1971.
- Ghanem, A., P. Steffler, F. Hicks, and C. Katopodis. 1994. Two-dimensional finite element flow modeling of physical fish habitat. Pages 84-89 *in* **Proceeding of the 1st International Association of Hydraulic Research Symposium on Habitat Hydraulics**.
- Gilbert, C.H. 1913. Age at maturity of the Pacific coast salmon of the genus *Oncorhynchus*. *United States Bureau of Fisheries Bulletin*, 32:1-22.
- Gilliam, J.F., and D.F. Fraser. 1987. Habitat selection under predation hazard: Test of a model with foraging minnows. *Ecology*, 68:1856-1862.
- Gislason, J. C. 1985. Aquatic Insect Abundance in a Regulated Stream under Fluctuating and Stable Diel Flow Patterns. Fisheries Research Institute, University of Washington, Seattle. *North American Journal of Fish Management*, 5:39-46.
- Glenn-Colusa Irrigation District, California Department of Fish and Game and CH2M Hill. 1989. Fish Protection and Gradient Restoration Facilities. Final Feasibility Report. Volume I.
- Godin, J-G J. 1981. Migrations of salmonid fishes during early life history phases: daily and annual timing *In* E.L. Brannon and E.O. Salo, editors. *Proceedings of the salmon and Trout Migratory Behavior Symposium*, School of Fisheries, University of Washington, Seattle, Washington.
- Goettl, J.P., Jr., and P.H. Davies. 1978. Water Pollution Studies. Job Progress Report, Federal Aid Project F-33-R-13. Colorado Department of Natural Resources, Division of Wildlife. Denver.
- Gore, J.A. and R.D.J. Judy. 1981. Predictive Models of Benthic Macroinvertebrate Density for Use in Instream Flow Studies and Regulated Flow Management.

- Gore, J.A., 1987. Development and applications of macroinvertebrate instream flow models for regulated flow management *In* J.F. Craig and J.B. Kemper, editors, Regulated Streams. Advances in Ecology, 99-115.
- Grant, W., and D.L. Kramer. 1990. Territory size as a predictor of the upper limit to population density of juvenile salmonids in streams. Canadian Journal of Fisheries and Aquatic Sciences, 47:1724-1737.
- Grant, W.E. 1986. Systems analysis and simulation in wildlife and fisheries sciences. John Wiley and Sons, New York.
- Gray, R.H. 1990. Fish behavior and environmental assessment. Environmental Toxicology and Chemistry, 9:53-67.
- Graybill, J.P., R.L. Burgner, J.C. Gilson, P.E. Huffman, K.H. Wyman, R.G. Gibbons, K.W. Kurko, Q.J. Stober, T.W. Fagnan, A.P. Stayman and D.M. Eggers. 1979. Assessment of the reservoir-related effects of the Skagit Project on downstream fishery resources of the Skagit River, Washington. Final Report. Fisheries Research Institute, University of Washington, Seattle.
- Grayton, B.D. and F.W.H. Beamish. 1977. Effects of feeding frequency on food intake, growth and body composition of rainbow trout (*Salmo gairdneri*). Aquaculture, 36:27-35.
- Green, R.H. 1979. Sampling design and statistical methods for environmental biologists. John Wiley and Sons, New York.
- Gregory, R. and C. Levings. 1998. Turbidity Reduces Predation on Migrating Juvenile Pacific Salmon. Transactions of the American Fisheries Society, 127:275-285.
- Griggs, M. 1993. Comments from the Staff of the State Lands Commission on Notice of Preparation of a Draft Environmental impact Report for the Sacramento County Water Agency and San Juan Suburban Water District. Central Valley Project. State Lands Commission.
- Grossman, G.D., and M.C. Freeman. 1987. Microhabitat use in a stream fish assemblage. Journal of Zoology, 212:151-176.
- Grossman, G.D., and V. Boule. 1991. An experimental study of competition for space between rainbow trout (*Onchorhynchus mykiss*) and rosyside dace (*Clinostomus funduloides*). Canadian Journal of Fisheries and Aquatic Sciences, 48:1235-1243.
- Hallock, R.J. 1989a. Upper Sacramento River steelhead, *Oncorhynchus mykiss*, 1952-1988 Prepared for United States Fish and Wildlife Service.
- Hallock, R.J. 1989b. Sacramento River system salmon steelhead problems and enhancement opportunities. A report to the California Commission on salmon and steelhead trout.
- Hallock, R.J. 1987. Sacramento River System Salmon and Steelhead Problems and Enhancement Opportunities. Prepared for the California Advisory Committee on Salmon and Steelhead Trout. June 22, 1987,
- Hallock, R.J. 1977a. A Description of the California Department of Fish and Game Management Program and Goals for the Sacramento River System Salmon Resource.

Administrative Report. California Department of Fish and Game, Anadromous Fisheries Branch.

Hallock, R.J. 1977b. Status of the Sacramento River System Salmon Resource and Escapement Goals. California Department of Fish and Game.

Hallock, R.J., and D.H. Fry, Jr. 1967. Five species of salmon *Oncorhynchus*, in the Sacramento River, California. California Department of Fish and Game, 53:5-22.

Hallock, R.J., and F.W. Fisher. 1985. Status of winter-run chinook salmon *Oncorhynchus fshawytscha*, in the Sacramento River. California Department of Fish and Game. Anadromous Fisheries Branch.

Hallock, R.J., and W.F. Van Woert. 1959. A survey of anadromous fish losses in irrigation diversions from the Sacramento and San Joaquin rivers. California Department of Fish and Game, 45:227-296.

Hallock, R.J., D.A. Vogel, and R. Reisenbichler. 1982. The effect of Red Bluff diversion dam on the migration of adult radio tagged fish. Administrative Report No. 82-8. California Department of Fish and Game.

Hallock, R.J., R.F. Elwell, and D.H. Fry, Jr. 1970. Migrations of adult king salmon, *Oncorhynchus fshawytscha*, in the San Joaquin River Delta as demonstrated by the use of sonic tags. California Department of Fish and Game. Fish Bulletin 151.

Hamilton, K., and E. Bergersen. 1984. Methods to estimate aquatic habitat variables. Report to the United States Bureau of Reclamation, Engineering and Research Center. Colorado Cooperative Fishery Research Unit, Denver.

Hampton, M. 1988. Development of habitat preference criteria for anadromous salmonids of the Trinity River. United States Department of the Interior, Fish and Wildlife Service, Division of Ecological Services.

Hankin, D.G. 1992. Comments on Sacramento County/East Bay Municipal Utility District Recommended 1992/93 Lower American River Study Program. Email communication to J.G. Williams, T. Kerstetter, and T. Payne. September 8, 1992.

Hankin, D.G. 1991. Interaction of hatchery and naturally-spawning chinook salmon stocks in Battle Creek, Shasta and Tehama counties. Draft report to the California Department of Fish and Game.

Hankin, D.G. 1990. Comments on the Draft Fry and Smolt Emigration Study Design. Letter to John Williams. October 31, 1990.

Hankin, D.G. 1990. Effects of monthly release of hatchery-reared chinook salmon on size at age, maturation schedule, and fishery contribution. Information Report 90-4. Fish Division, Oregon Department of Fish and Wildlife, Portland, Oregon.

Hankin D.G. 1986. Variation in life history traits of Oregon's coastal chinook salmon stocks. Department of Fisheries, Humboldt State University. Unpublished Manuscript.

- Hankin, D.G. 1982. Estimating escapement of Pacific salmon: Marking practices to discriminate wild and hatchery fish. *Transactions of the American Fisheries Society*, 111:286-298.
- Hankin, D.G. and R. McKeivey, 1985. Comment on fecundity of chinook salmon and its relevance to life history theory. *Canadian Journal of Fisheries and Aquatic Sciences*, 42:393-394.
- Hanson Environmental, Incorporated and Beak Consultants, Incorporated. 1991. Recommended Program of Fisheries Investigations, Lower American River 1991-92.
- Hanson Environmental, Incorporated, Beak Consultants, Incorporated, California Department of Fish and Game. 1991. Lower American River Fishery and Aquatic Resource Investigations: Results of Phase I Studies and Recommendations for Phase II Investigations. Preliminary Draft. Environmental Services. September 1991.
- Hanson Environmental, Incorporated. 1993a. Development and Implementation Plan for Lower American River Scientific Studies Required by the Alameda County Superior Court's 1990 Physical Solution. Prepared for the East Bay Municipal Utility District.
- Hanson Environmental, Incorporated. 1993b. Management of Lower American River Fisheries Investigations. May 20, 1993.
- Hanson, C.H. 1992. Effects of Water Temperature on the Early Life stages of Chinook Salmon.
- Hanson, C.H. 1990. Laboratory Information on the Effect of Water Temperature on Juvenile Chinook Salmon in the Sacramento and San Joaquin Rivers: A Literature Review. February 1990.
- Hanson, H.A., O.R. Smith and P.R. Needham. 1940. An investigation of fish salvage problems in relation to Shasta Dam. Special Scientific Report No. 10. United States Fish and Wildlife Service.
- Haro, A., M. Odeh, J. Noreika, and T. ~~Castro-Santos~~. 1998. Effect of Water Acceleration on Downstream Migratory Behavior and Passage of Atlantic Salmon Smolts and Juvenile American Shad at Surface Bypasses. *Transactions of the American Fisheries Society*, 127:118-127.
- Harris, R. 1984. Proceedings of the Workshop on Instream Flow Requirements for Riparian Vegetation in the Sierra Nevada. Sponsored by Pacific Gas and Electric Company and Southern California Edison Company.
- Hartwell, R.D. 1994. Upstream migration and spawning of fall run chinook salmon in the Mokelumne River, 1993. East Bay Municipal Utility District.
- Hartwell, R.D. 1993. Rearing of juvenile chinook salmon in the lower Mokelumne River, 1993. East Bay Municipal Utility District.
- Harvey, B.C. and T.E. Lisle. 1999. Scour of chinook salmon redds on suction dredge tailings. *North American Journal of Fisheries Management* 19:613-617.
- Hatton, S.R. and G.H. Clark. 1942. Central Valley Fisheries Investigations. A Second Progress Report. Bureau of Marine Fisheries, California Division of Fish and Game. 28:116-123.

HDR Engineering, Incorporated and Montgomery Watson. 1993. American River Watershed Sanitary Survey. Prepared for City of Sacramento and other Sacramento area water agencies.

Healey, M.C. 1993. Abstracts from: Healey on Sacramento River Chinook in Perspective, Harvey on Return to Spawn and Spawning, Kjelson on Emigration, Kope on Ocean Issues for California Salmon, Mangel on Chinook Life History Theory and Modeling, Foott on Disease: Natural Component in Chinook Life History Discussant Points, Saiki and Finlayson on Workshop on Central Valley Chinook Salmon Contaminant Problems, and Cox on Workshop on Central Valley Chinook Salmon. January 4 and 5, 1993.

Healey, M.C. 1991. Life history of chinook salmon (*Oncorhynchus tshawytscha*). Pages 311-393 *in* C. Groot and L. Margolis, editors. Pacific salmon life histories. University of British Columbia Press, Vancouver.

Healey, M.C. 1983. Coastwide distribution and ocean migration patterns of stream- and ocean-type chinook salmon (*Oncorhynchus tshawytscha*). Canadian Field Naturalist, 97:427-433.

Healey, M.C. 1980. Utilization of the Nanaimo River estuary by juvenile chinook salmon, *Oncorhynchus tshawytscha*. Fish Bulletin, 77:653-668.

Healey, T.P. 1979. The effect of high temperature on the survival of Sacramento River chinook (king) salmon, *Oncorhynchus tshawytscha*, eggs and fry. California Department of Fish and Game. Anadromous Fisheries Branch, Administration Report No. 79-10.

Healey, M.C. and W.R. Heard. 1984. Inter- and intra- population variation in the fecundity of chinook salmon (*Oncorhynchus tshawytscha*) and its relevance to life history theory. Canadian Journal of Fisheries and Aquatic Sciences, 41:476-483

Heggenes, J., and T. Traaen. 1988. Downstream migration and critical water velocities in stream channels for fry of four salmonid species. Journal of Fish Biology, 32:717-727.

Heggenes, J., S.J. Saltveit, K.A. Vaskinn, and O. Kingaas. 1994. Predicting fish habitat use response in water flow regime: modeling critical minimum flows for Atlantic salmon, *Salmo salar*, and brown trout, *S. trutta*, in a heterogeneous stream. Pages 124-142 *in* Proceeding of the First International Association for Hydraulic Research Symposium on Habitat Hydraulics. Norwegian Institute of Technology, Trondheim, Norway.

Heming, T.A. 1982. Effects of temperature on utilization of yolk by chinook salmon (*Oncorhynchus tshawytscha*) eggs and alevins. Canada Journal of Fisheries Aquatic Science, 39:184-190.

Heming, T.A., and J.E. McInerney. 1982. Effect of temperature on initial feeding in alevins of chinook salmon (*Oncorhynchus tshawytscha*). Canadian Journal of Fisheries and Aquatic Sciences, 39:1554-1562

Henderson, M.A. and A.J. Cass. 1991. Effect of smolt size of smolt-to-adult survival for Chilko Lake sockeye salmon (*Oncorhynchus nerka*) Canadian Journal of Fisheries and Aquatic Sciences, 48:988-994

- Herling, B. 1982. Coupling of one-and two-dimensional finite elements for the computation of tidal flows in estuaries. *Advances in Water Resources*, 5(4):227-232.
- Hervouet, J.M. 1992. Solving shallow water equations with rapid flows and tidal flats. Pages 537-548 *In* W.R. Blain and E. Cabrera, editors. *Hydraulic Engineering Software 4*. Fluid flow modeling. Elsevier Applied Science, London.
- Hetrick, N., M. Brusven, W. Meehan, and T. Bjornn. 1998. Changes in Solar Input, Water Temperature, Periphyton Accumulation, and Allochthonous Input and Storage after Canopy Removal along Two Small Salmon Streams in Southeast Alaska. *Transactions of the American Fisheries Society*, 127:859-875.
- Hewitt, R. 1981. The value of pattern in the distribution of young fish. *Rapport. P-v. Cons. Int. Explorer. Mer.*, 178:229-236.
- Hewitt, R., A. Bindman, and N. Lo. 1984. Procedures for calculating the egg production estimate of spawning biomass. Administrative Report LJ-84-19. Southwest Fisheries Center.
- Hicks, D. 1966. Determination of how or if releases can be manipulated from Tenkiller Ferry Reservoir to improve habitat for trout. Job Comprehensive Report. Department of Wildlife.
- Higgins, P.S. Dobush and D. Fuller. 1992. Factors in Northern California threatening stocks with extinction. Unpublished manuscript. Humboldt Chapter of the American Fisheries Society.
- Hilborn, R. 1992. Hatcheries and the future of salmon in the northwest. *Fisheries* 17(1):5-8.
- Hilborn, R. and D. Eggers. 2000. A Review of the Hatchery Programs for Pink Salmon in Prince William Sound and Kodiak Island, Alaska. *Transactions of the American Fisheries Society*, 129:333-350.
- Hilborn, R. and J. Winton. 1993. Learning to enhance salmon production: lessons from the salmonid enhancement program. *Canadian Journal of Fisheries and Aquatic Sciences* 50:2043-2056.
- Hill, J. 1989. *The* energetic significance of microhabitat use in two stream fishes. Doctoral Dissertation. University of Georgia, Athens.
- Hill, J. and G.D. Grossman. 1993. An Energetic Model of Microhabitat use for Rainbow Trout and Rosyside Dace. *School of Forest Resources, University of Georgia. Ecology*, 74:685-698.
- Hill, J. and G.D. Grossman. 1987. Effects of subcutaneous marking on stream fishes. *Copeia*, 1987:492-495.
- Hill, J. and G.D. Grossman. 1987. Home range estimates for three North American stream fishes. *Copeia*, 1987:376-380.
- Hillman, T.W., J.S. Griffith, and W.S. Platts. 1987. Summer and winter habitat selection by juvenile chinook salmon in a highly sedimented Idaho stream. *Transactions of the American Fisheries Society*, 116:185-195.

- Hinckley, T.M., J.E. Roberts and R.O. Teskey. 1979. A severe drought: impact on tree growth, phenology, net photosynthetic rate and water relations. *American Midland Naturalist*, 102:307-316.
- Hinton, D.E. and D.J. Lauren. 1990. Liver structural alterations accompanying chronic toxicity in fishes: potential biomarkers of exposure. Pages 17-57 *In* J.F. McCarthy and L.R. Shugart, editors. *Biomarkers of Environmental Contamination*. Lewis Publishers, CRC Press, Boca Raton, Florida.
- Hinze, J.A. 1956. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1955-56. California Department of Fish and Game.
- Hinze, J.A. 1957. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1956-57. California Department of Fish and Game.
- Hinze, J.A. 1958. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1957-58. California Department of Fish and Game.
- Hinze, J.A. 1959. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1958-59. California Department of Fish and Game.
- Hinze, J.A. 1960. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1959-60. California Department of Fish and Game.
- Hinze, J.A. 1961. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1960-61. California Department of Fish and Game.
- Hinze, J.A. 1962. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1961-62. California Department of Fish and Game.
- Hinze, J.A. 1963. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1962-63. California Department of Fish and Game.
- Hinze, J.A. 1964. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1963-64. California Department of Fish and Game.
- Hinze, J.A. 1965. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1964-65. California Department of Fish and Game.
- Hoar, **W.S.** 1953. Control and timing of fish migration. *Biological Reviews of the Cambridge Philosophical Society*, 28:437-452.
- Hodge, R.A. 1990. **Buckhorn Canyon Legal Defense Fund, County of Sacramento, People of the State of California, and the California Department of Fish and Game vs. East Bay Municipal Utility District.**
- Hodgkins, F.I. 1991. Context for Putting the Phase II Fisheries Studies Before the Board. McDonough Holland & Allen.
- Hodgkins, F.I. 1991. Sacramento County comments on "American River Studies: Intensive Fish Surveys" and "Growth, Condition, and Physiological Performance and Juvenile Salmonids from the Lower American River: February through June, 1991." Letter to John G. Williams. County of Sacramento. December 9, 1991.

- Hodgkins, F.I. 1992a. 1992-1993 Study Program. Letter to John G. Williams. County of Sacramento. Department of Public Works. August 27, 1992.
- Hodgkins, F.I. 1992b. John G. Williams' Comments on the County's Proposal for 1992-1993 Studies. County of Sacramento. Department of Public Works.
- Hodgkins, F.I. 1992c. Recommended 1992/1993 Lower American River Study Program. County of Sacramento. Department of Public Works.
- Hoffman, J. 1980. Determining optimum releases from Lewiston Dam to improve salmon and steelhead habitat in the Trinity River, California. United States Fish and Wildlife Service, Division of Ecological Services.
- Holt, R.A., J.E. Sander, J.L. Zin, J.L. Fry, and K.S. Pilcher. 1975. Relation of water temperature to *Flexibacter columnaris* infection in steelhead trout and chinook salmon. Journal of the Fisheries Research Board, Canada, 32:53-59.
- Hoopaugh, D.A. 1978. King (chinook) salmon spawning stocks in California's Central Valley, 1976. California Department of Fish and Game, Anadromous Fisheries Branch, Administrative Report No. 78-19.
- Hoopaugh, D.A., and A.C. Knutson, Jr. 1979. Chinook (king) salmon spawning stocks in California's Central Valley, 1977. California Department of Fish and Game, Anadromous Fisheries Branch, Administrative Report No. 79-11.
- Hubbell, P. 1973. A program to identify and correct salmon and steelhead problems in the Trinity River Basin. Prepared for Trinity River Basin Fish and Wildlife Task Force. California Department of Fish and Game.
- Huffman, P.E. 1982. The effects of environmental factors on diet, size, and condition of Skagit River juvenile salmonids. Master's Thesis. University of Washington, Seattle.
- Hunter, C.J. 1991. Better trout habitat: a guide to stream restoration and management. Island Press, Washington, D.C.
- Hunter, J.W. 1973. A discussion of game fish in the State of Washington as related to water requirements. Washington Department of Game.
- Hunter, M.A. 1991. Effects of Hydropower Flow Fluctuations on Salmonids. State of Washington, Department of Fisheries. Peer Review Draft.
- Hurlburt, S.H. 1984. Pseudoreplication and the design of ecological field experiments. Ecological Monographs, 54:187-211.
- Hurst, E., M. Hehnke, and C.C. Goude. 1980. The destruction of riparian vegetation and its impact on the avian wildlife in the Sacramento River Valley, California. American Birds, January 1980.
- Huston, M., D. De Angelis, and W. Post. 1988. New computer models unify ecological theory. BioScience, 38(10):682-691.

- Hymanson, Z.P. 1991. Results of a spatially intensive survey for *Potamocorbula amurensis* in the San Francisco Bay Estuary. Technical Report 30, Interagency Ecological Studies Programs for the Sacramento-San Joaquin Estuary.
- Hynes, H.B.N. 1970. The ecology of running waters. University of Toronto Press.
- Inman, D.L. 1952. Measures for describing the size distribution of sediments. Journal of Sedimentary Petrology, 22:125-145.
- J. H. Kleinfelder and Associates. 1984. A Progress Report: Reconnaissance assessment of geomorphic conditions affecting salmon, lower American River, California.
- Jackson Research Projects. 1985. Historical Summary: Lower American River. Prepared for McDonough, Holland & Allen. February 11, 1985.
- Jackson, T.A. 1992. Microhabitat Utilization by Juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) in Relation to Stream Discharges in the Lower American River of California. Undergraduate thesis submitted to Oregon State University. July 28, 1992.
- Jacobs, D. 2000. Upper Sacramento River Fisheries/Riparian Habitat Management Plan. New Habitat/Riparian Part. In Preparation.
- Jacobs, D.J. 1996. Draft letter to the Honorable Richard Hodge. State Lands Commission. April 26, 1996.
- Jager, H.I. and five coauthors. 1997. Modeling the linkages between flow management and salmon recruitment in streams. Ecological Modelling 103:171-191.
- Jenkins, T.M., Jr. 1969. Night feeding of brown and rainbow trout in an experimental stream channel. Journal of the Fisheries Research Board of Canada, 26:3275-3278.
- Jenkins, T.M., Jr. 1969. Social structure, position choice and microdistribution of two trout species (*Salmo trutta* and *Salmo gairdneri*) resident in mountain streams. Animal Behavior Monographs, 2:57-123.
- Jenson, J.O.T. and D.F. Alderdice. 1984. Effects of Temperature on Short-Term Storage of Eggs and Sperm of Chum Salmon.
- Jochimsen, W.H. 1979. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1978-79. California Department of Fish and Game.
- Jochimsen, W.H. 1978. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1977-78. California Department of Fish and Game.
- Jochimsen, W.H. 1977. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1976-77. California Department of Fish and Game.
- Jochimsen, W.H. 1976. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1975-76. California Department of Fish and Game.
- Jochimsen, W.H. 1975. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1974-75. California Department of Fish and Game.

- Jochimsen, W.H. 1974. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1973-74. California Department of Fish and Game.
- Jochimsen, W.H. 1973. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1972-73. California Department of Fish and Game.
- Jochimsen, W.H. 1972. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1971-72. California Department of Fish and Game.
- Jochimsen, W.H. 1971. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1970-71. California Department of Fish and Game.
- Jochimsen, W.H. 1970. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1969-70. California Department of Fish and Game.
- Jochimsen, W.H. 1969. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1968-69. California Department of Fish and Game.
- Jochimsen, W.H. 1968. Annual Report: Nimbus Salmon and Steelhead Hatchery, Fiscal Year 1967-68. California Department of Fish and Game.
- Jochimsen, W.H. 1967. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1966-67. California Department of Fish and Game.
- Jochimsen, W.H. 1966. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1965-66. California Department of Fish and Game.
- Johannis, J. 1996. Cumulative Impact Analysis. Letter to De Cuir & Somach. United States Bureau of Reclamation. May 22, 1996.
- Johnson, H.E. and R.F. Brice. 1953. Effects of transportation of green eggs, and of water temperature during incubation, on the mortality of chinook salmon. *Progressive Fish-Culturist*, 15(3):104-108.
- Johnson, R.A. 1980. Oxygen Transport in salmon spawning gravels. *Canadian Journal of Fisheries and Aquatic Sciences*, 37:155-162.
- Jones & Stokes Associates, Incorporated. 1998. Floodway Management Plan for the Lower American River. Prepared for the Sacramento Area Flood Control Agency. November 1998.
- Jones & Stokes Associates, Incorporated. 1996. Adopted Final Environmental Assessment and Initial Study of Streambank Protection at River Park - Lower American River. June 1996.
- Jones & Stokes Associates, Incorporated. 1992. Water Rights Hearing on the Lower Yuba River, February 10, 11, and 13, 1992. 1992. Expert testimony on Yuba River fisheries by Jones & Stokes Associates' aquatic and environmental specialists representing Yuba County Water Agency. January 20, 1992. Prepared for State Water Resources Control Board.

- Jones & Stokes Associates, Incorporated. 1991. Evaluation of the effects of flow fluctuations on Yuba River chinook salmon redds and fry, October 15-December 31, 1990. January 31, 1991. Prepared for Yuba County Water Agency.
- Jones & Stokes Associates, Incorporated. 1990. 1990 Field investigations of Yuba River American shad. Prepared for Yuba County Water Agency.
- Jones & Stokes Associates, Incorporated and Montgomery Watson. 1995. American and Sacramento Rivers Project, Task 4: Folsom Dam and Reservoir Permanent Reoperation. Administrative Report.
- Jones, G.H. 1967. Alteration of the Regimen of Sacramento River and Tributary Streams Attributable to Engineering Activities During the Past 116 Years. Prepared for the Historical Records of Sacramento Section of American Society of Civil Engineers.
- Kadlec, J.A. 1976. Methodologies for assessing instream flows for wildlife. Pages 355-363 *In* Proceedings of the symposium and special conference on instream flow needs. May 3-6, 1979. American Fisheries Society.
- Kalleberg, H. 1958. Observations in a stream tank of territoriality and competition in juvenile salmon and trout (*Salmo salar* L. and *S. trutta* L.). Report of the Institute of Freshwater Research Drottningholm, 39:55-98.
- Kano, R.M. 1982. "Responses of Juvenile Chinook Salmon, *Oncorhynchus tshawytscha*, and American Shad, *Alosa sapidissima*, to Long-Term Exposure to Two-vector Velocity Flows." Technical Report, 4, Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary, pp. 20.
- Katibah, E.F. 1984. A brief history of riparian forests in the Central Valley of California. In R.E. Warner and K.M. Hendrix, editors Proceedings of the California riparian systems conference. University of California, Davis, September 17-19, 1981. University of California Press, Berkeley.
- Kawahara, M., and T. Umetsu.. 1986. Finite element method for moving boundary problems in river flows. International Journal of Numerical Methods in Fluids, 6:365-386.
- Keith, R., T. Bjorn, W. Meehan, J. Hetrick, and M. Bursven. 1998. Response of Juvenile Salmonids to Riparian and Instream Cover Modifications in Small streams Flowing through Second-Growth Forests of Southeast Alaska. Transactions of the American Fisheries Society, 127:889-907.
- Kellerhals, R., and D.I. Bray. 1971. Sampling procedures for coarse fluvial sediments. Journal of the Hydraulics Division, American Society of Civil Engineers, 97 HYD:1165-1179.
- Kelley, D.W., P.M. Bratovich, H. Rooks, and D.H. Dettman. 1985. The Effect of Streamflow on Fish in the Lower American River: Second Report. Prepared for Best, Best & Krieger. October 1985.
- Kennedy, H.D. 1967. Seasonal abundance of aquatic invertebrates and their utilization by hatchery-related rainbow trout. Technical Paper 12. United States Bureau of Sport Fisheries and Wildlife, Washington, D.C.

- Kershner, J.L. and B. Snider. 1992. Using habitat level classifications in instream flow studies, *In* River Conservation and Management. John Wiley and Sons, New York.
- Kershner, J.L. and B. Snider. n.d. Observation of habitat use and the relationship to brown trout and rainbow trout distribution in the Little Truckee River. Utah State University, Logan.
- Kerstetter, T. 1993. American River Fisheries Research Expert Review Panel Comments and Recommendations on the Revised 1992/93 Lower American River Study Program. Humboldt State University.
- Kerstetter, T. 1992. Views on the Physiological Subprogram of the American River Fisheries Investigation ordered by Judge Hodge. Letter to Dr. John Williams. Humboldt State University. September 9, 1992.
- Kerstetter, T. and M. Keeler. 1976. Smolting in steelhead trout *Salmo gairdneri*: A comparative study of populations in two hatcheries and the Trinity River, Northern California, using Gill, Na, K, ATPase assays. Humboldt State University Sea Grant No. 9.
- King, J.R., B.J. Shuter, and A.P. Zimmerman. 1999. Empirical Links between Thermal Habitat, Fish Growth, and Climate Change. Transactions of the American Fisheries Society, 128:656-665.
- Kjelson, M.A. and P.L. Brandes. 1989. The use of smolt survival estimates to quantify the effects of habitat changes on salmonid stock in the Sacramento-San Joaquin Rivers, California. Pages 100-115 *In* Proceeding of the National Workshop on Effects on Habitat Alteration on Salmonid Stocks, C.D. Levings, L.B. Holtby, and M.A. Henderson, editors. Canadian Special Publication of Fisheries and Aquatic Sciences, 105.
- Kjelson, M.A., P.F. Raquel and F. Fisher. 1981. The life history of fall-run juvenile chinook salmon (*Oncorhynchus tshawytscha*) in the Sacramento-San Joaquin Estuary, California.
- Kjelson, M.A., S. Greene, and P. Brandes. 1989. A model for estimating mortality and survival of fall-run chinook salmon smolts in the Sacramento River Delta between Sacramento and Chipps Inland. United States Fish and Wildlife Service.
- Knight, A.W., and R.L. Bortorff. 1984. The importance of riparian vegetation to stream ecosystems. *In* R.E. Warner, and K.M. Hendrix, editors. California Riparian Systems. University of California Press, Berkeley, CA.
- Knutson, A.C.J. 1980. King (Chinook) Salmon Spawning Stocks in California's Central Valley, 1978. California Department of Fish and Game.
- Kohlhorst, D.W. 1976. Sturgeon spawning in the Sacramento River in 1973, as determined by distribution of larvae. California Department of Fish and Game 62(1):32-40.
- Kohlhorst, D.W. 1980. Recent trends in the white sturgeon population in California Sacramento-San Joaquin estuary. California Department of Fish and Game, 66(4):210-219.
- Kohlhorst, D.W. 1993. Use of mathematical model as a management tool to evaluate sport angling. Second International Symposium on the Sturgeon, September 1993. Moscow, Russia.

- Kondolf, G.M. 2000. Assessing Salmonid Spawning Gravel Quality. Transactions of the American Fisheries Society, 129:262-281.
- Kondolf, G.M. and M.G. Wolman. 1993. The sizes of salmonid spawning gravels. Water Resources Research, 29(7): 2275-2285.
- Kondolf, G.M., M.J. Sale, and M.G. Wolman. 1993. Modification of fluvial gravel size by spawning salmonids. Water Resources Research, 29(7): 2265-2274.
- Kondolf, G.M. 2000. Assessing salmonid spawning gravel quality. Transactions of the American Fisheries Society, 129:262-281.
- Kondolf, G.M. 1995. Use of pebble counts to evaluate fine sediment increase in stream channels, by J. P. Potyondy and T. Hardy. Discussion No. 93127D *In* Water Resources Bulletin, 31(3): 537.
- Kondolf, G.M. 1988. Salmonid spawning gravels: A geomorphic perspective on their size distribution, modification by spawning fish, and criteria for gravel quality. Doctoral Dissertation. Department of Geography and Environmental Engineering, Johns Hopkins University, Baltimore, Maryland.
- Kondolf, G.M. and M. Katzel. 1991. Spawning gravel resources of Battle Creek, Shasta and Tehama counties. Draft report to Thomas R. Payne and Associates.
- Kondolf, G.M. and M.L. Swanson. 1993. Channel adjustments to the reservoir construction and gravel extraction along Stony Creek, California. Environmental Geology, 21:256-259.
- Kondolf, G.M. and S. Li. 1992. The pebble count technique for quantifying surface bed material size in instream flow studies. Rivers, 3(2): 80-87.
- Kondolf, G.M. and W.V.G. Matthews. 1993. Management of coarse sediment on regulated rivers. University of California, Berkeley, Report No. 80.
- Kramer, D. and P.E. Smith. 1971. Seasonal and geographic characteristics of fishery resources. California Current Region - VII. Pacific Sardine. Commercial Fisheries Revision, 33:7-11.
- Krebs, J.R. and N.B. Davies. 1991. Behavioral Ecology. An Evolutionary Approach. Blackwell Scientific, London.
- Kreeger, K.Y. and W.J. McNeil. 1992. A Literature Review of Factors Associated with Migration of Juvenile Salmonids. Prepared for Direct Service Industries. October 23, 1992.
- Ladensack, K. 1996. Draft Letter to Judge Hodge, from Liaison Group regarding EDF vs. EBMUD Physical Solution. Letter to Keith DeVore, Sacramento County; Tom Graff, Environmental Defense Fund, Jim White, California Department of Fish and Game; Diana Jacobs, State Lands Commission; and Jim Jones, Save the American River Association. East Bay Municipal Utility District. April 3, 1996.
- Larkin, P.A. 1988. Pacific Salmon. Pages 153-183 *In* J.A. Gulland, editor. Fish Population Dynamics: The implications for management, 2nd edition. John Wiley and Sons, New York.

- Lassen, R.W. 1975. American River King Salmon Inventory, 1974, with attachment. Transmittal to Chief of Operations of California Department of Fish and Game, Region 2 April 25, 1975.
- Lassen, R.W. 1974. American River Salmon Inventory 1973, with attachment. Transmittal to Chief of Operations of California Department of Fish and Game, Region 2. March 11, 1974.
- Lassen, R.W. 1972. Removal of North San Joaquin Vertical Drum Fish Screen, Mokelumne River. Memorandum to Chief of Operations. California Department of Fish and Game. Region 2. December 26, 1972.
- Leclerc, M., A. Boudreault, J.A. Bechara, and G. Corfa. 1995. Two-Dimensional Hydrodynamic Modeling: A Neglected Tool in the Instream Flow Incremental Methodology. Transactions of the American Fisheries Society, 124:645-662.
- Leclerc, M., S. Bobee, A. Boudreault, G. Shooner, and G. Corfa. 1997. Instream flow incremental methodology and 2-D hydrodynamic modeling: Efficient tools to determine guaranteed minimum flow for biological purposes. Pages 289-300, *In* D. Ouazar, D. Ben Sari, and C.A. Brebbia, editors. Computer Methods in Water Resources 2: Computational Hydraulics and Hydrology. Proceedings of the Second International Conferences, Marrakech, Morocco. Springer-Verlag, Berlin.
- Leclerc, M., J.F. Bellemare, G. Dumas, and G. Dhatt. 1990. A finite element model of estuarine and river flows with moving boundaries. Advances in Water Resources, 13(4): 158-168.
- Leggett, W.C. and R.R. Whitney. 1972. Water temperature and the migrations of American shad. National Marine Fisheries Service. Bulletin 70:659-670.
- Lehmkuhl, D.M. 1972. Change in thermal regime as a cause of reduction of benthic fauna downstream of a reservoir. Journal of the Fisheries Research Board of Canada, 29:1329-1332.
- Leidy, G. and M. Myers. 1984. Special Report. Central Valley fish and wildlife management study: fishery management problems at major Central Valley reservoirs, California. United States Bureau of Reclamation, Mid-Pacific Region.
- Leidy, G.R. and S. Li. 1987. Analysis of river flows necessary to provide water temperature requirements of anadromous fishery resources of the Lower American River. Lower American River Court Reference, Environmental Defense Fund v. East Bay Municipal Utility District. Exhibit No. 69-A. Prepared for McDonough, Holland, & Allen.
- Leidy, R.A. and G.R. Leidy. 1984. Life stage periodicities of anadromous salmonids in the Klamath River Basin, northwestern California. United States Fish and Wildlife Service, Division of Ecological Services.
- Leim, A.H. 1924. The life history of shad (*Alosa sapidissima*) with special reference to the factors limiting its abundance. Biology, 2(11):161-284.
- Leitritz, E. and R.C. Lewis. 1980. Trout and salmon culture (hatchery methods). California Fish Bulletin Number 164, University of California Press.

- Leopold, L.B. 1970. An improved method for size distribution of stream-bed gravel. *Water Resources Research*, **6**(5):1357-1366.
- Lettenmaier, D.P. and T.Y. Gan. 1990. Hydrologic sensitivities of the Sacramento-San Joaquin River basin, California, to global warming. *Water Resources Research*, **26**:69-86.
- Lewis, S.L. 1969. Physical factors influencing fish populations in pools of a trout stream. *Transactions of the American Fisheries Society*, **98**:14-19.
- Lisle, T.E. 1989. Sediment transport and resulting deposition in spawning gravels, north coastal. California. *Water Resources Research*, **25**:1303-1319.
- Lisle, T.E. and R.E. Eads. 1991. Methods to measure sedimentation of spawning gravels. United States Forest Service, Research Note, PSW-411.
- Lister, D.B. and H.S. Genoe. 1970. Stream habitat utilization by cohabiting under yearlings of chinook (*Oncorhynchus fshawytscha*) and coho (*Oncorhynchus kissutch*) salmon in the big Qualicum River, British Columbia. *Journal of the Fisheries Research Board of Canada*, **27**:1215-1224.
- Lister, D.B., R.A.L. Harvey, and C.E. Walker. 1969. A modified wolf trap for downstream migrant young fish enumeration. *California Fish-Culturist*, **40**:57-60.
- Loucks, D.P. (ed.) 1998. *Restoration of Degraded Rivers: Challenges, Issues and Experiences*. Norwell, Massachusetts. Kluwer Academic Publishers.
- Lotspeich, F.B. and F.H. Everest. 1981. A new method for reporting and interpreting textural composition of spawning gravel. United States Forest Service Research Note.
- Lower American River Technical Team. 1997. Lower American River Stressors and Example Restoration Items. Materials prepared for first Lower American River Technical Team Meeting for the Sacramento Area Water Forum. March 13, 1997.
- Lungren, D.E. and M. Rodriguez. 1995. Comments on the Report of the Special Master, Water Years 1990-1993. Letter to John G. Williams. California State Lands Commission. March 17, 1995.
- Lynch, D.R. and W.G. Gray. 1978. Finite simulation of shallow water problems with moving boundaries. *In* C.A. Brebbia, W.G. Gray, and G.F. Pinder, editors. *Proceedings of the second international conference on finite elements in water resources*. 2,2302.42 Pentech Press, London.
- MacLean, J.A. and D.O. Evans. 1981. The stock concept, discreteness of fish stocks, and fisheries management. *Canadian Journal of Fisheries and Aquatic Sciences*, **38**:1889-1898.
- Mahoney, D.L., and D.C. Erman. 1984. The role of streamside bufferstrips in the ecology of aquatic biota. Pages 168-176, *In* R.E. Warner and K.M. Hendrix, editors. *California Riparian Systems*. University of California Press, Berkeley.
- Mangel M., and P.E. Smith. 1990. Presence-absence sampling for fisheries management. *Canadian Journal of Fisheries and Aquatic Sciences*. *Fisheries and Oceans*, **47**:1875-1887.

- Mangel, M. 1993. Climate Change and Salmonid Life History Variation. Section of Zoology and Center for Population Biology. Draft. February 19, 1993.
- Mangel, M. and C.W. Clark. 1988. Dynamic Modeling in Behavioral Ecology. Princeton University Press.
- Mansueti, R.J. and H. Kolb. 1953. A historical review of the shad fisheries of North America. Report Research Educational Publication 97.
- Marine, K. 1992. Progress Report on contracted task to conduct a review of the effects of elevated water temperature on the reproductive performance of Adult Chinook Salmon. University of California, Davis. July 16, 1992.
- Marine, K.R. 1992. A background investigation and review of the effects of elevated water temperature on reproductive performance of adult chinook salmon (*Oncorhynchus tshawytscha*) with suggestions for approaches to the assessment of temperature induced reproductive impairment of chinook salmon stocks in the American River, California. Unpublished Report to Environmental Defense Fund v. East Bay .Municipal Utility District parties.
- Markmann, C. 1986. Benthic monitoring in the Sacramento-San Joaquin Delta: Results from 1975 through 1981. Technical Report 12, Interagency Ecological Studies Program for the Sacramento-San Joaquin Estuary. California Department of Fish and Game.
- Marshall, S.L. and S.S. Parker. 1982. Pattern identification in the microstructure of sockeye salmon (*Oncorhynchus nerka*) otoliths. Canadian Journal of Fisheries and Aquatic Sciences, 39:542-547.
- Maslin, P.E. and W.A. McKinney. 1994. Tributary rearing by Sacramento River salmon and steelhead. Unpublished report. California State University, Chico. May 30, 1994.
- Massman, W.H. 1952. Characteristics of spawning areas of shad, *Alosa sapidissima* in some Virginia streams. Transactions of the American Fisheries Society, 81:78-93.
- Mathur, D., W.H. Bason, E.D. Purdy Jr., and C.A. Silver. 1985. A critique of the instream flow incremental methodology. Canadian Journal of Fisheries and Aquatic Sciences, 42:825-831.
- Maule, A.G., C.B. Schreck, C.S. Bradford and B.A. Barton. 1988. Physiological effects of collecting and transporting emigrating juvenile chinook salmon on past dams on the Columbia River. Transactions of the American Fisheries Society, 117:245-261.
- McBain & Trush. 1998. Tuolumne River Corridor Restoration Plan, Stanislaus County, California. Draft. Prepared for Tuolumne River Technical Advisory Committee. June 17, 1998.
- McCall, A.D. 1987. Sampling highly aggregated populations with application to California sardine management. Lecture notes in biomathematics. Springer-Verlag, 28:75-102.
- McCall, A.D. 1988. From egg surveys to ecosystem models: biological assumptions in fisheries management. Lecture notes in coastal and estuarine studies. Springer-Verlag, 28:75-102.

- McCall, A.D., 1985. Decision and Control in Uncertain Resource Systems. Academic Press, New York.
- McClay, C. 1970. A theory concerning the distance traveled by animals entering the drift of a stream. Journal of the Fisheries Research Board of Canada, 27:359-370.
- McClintock, J.B. 1986. On estimating energetic values of prey: Implications in optimal diet models. Oecologia Berlin, 70:161-162.
- McDonough Holland & Allen. 1985. Proposal Regarding Physical Solution, Lower American River Litigation. Prepared for the Sacramento County Board of Supervisors. July 9, 1985.
- McDonough, Holland & Allen. 1991. Discussion Draft and Finding and Management Proposal - Lower American River Investigations. Memorandum to Service List. April 16, 1991.
- McDonough, Holland & Allen. 1991. Phase II Fisheries Studies. Memorandum to K. DeVore. November 25, 1991.
- McElhany, P., M. Ruckelhaus, M.J. Ford, T. Wainwright, and E. Bjorkstedt. 1999. Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units. National Marine Fisheries Service Draft Report. December 13, 1999.
- McEwan, D. and J. Nelson. 1991. Steelhead restoration plan for the American River. California Department of Fish and Game.
- McEwan, D. and T. A. Jackson. 1996. Steelhead restoration and management plan for California. California Department of Fish and Game. February 1996.
- McEwan, D., and T. Jackson. 1993. Steelhead management plan for California. California Department of Fish and Game.
- McFadden, J.T. 1969. Dynamics and regulation of salmonid populations in stream. Pages 313-328 *In* Symposium on Salmon and Trout in Steams. T.G. Northcote, editor. University of British Columbia, Institute of Fisheries, Vancouver.
- McGill, R.R., Jr. 1983. Land Use Change in the Sacramento River Riparian Zone, Redding to Colusa; A Second Update: 1977-1982. California Department of Water Resources, Northern District.
- McGill, R.R., Jr. 1979. Land Use Change in the Sacramento River Riparian Zone, Redding to Colusa; An Update: 1972-1977. California Department of Water Resources, Northern District.
- McGill, R.R., Jr. 1978. Sacramento River Environmental Atlas, 1978. California Department of Water Resources, Northern District.
- McGill, R.R., Jr. 1975. Land Use Changes in the Sacramento River Riparian Zone, Redding to Colusa. California Department of Water Resources, Northern District.
- McGregor, E.A. n.d. Notes on the Egg Yield of Sacramento River King Salmon.,

- McGregor, E.A. 1923. A possible separation of the river races of king salmon in ocean-caught fish by means of anatomical characters. California Department of Fish and Game, 9:138-150.
- McGuire Environmental Consultants, Incorporated. 1993. Relative Risks of the Sacramento and American Rivers as sources of Water Supply. Prepared for the City of Sacramento.
- McLean, H. 1995. April Status Report on Lower American River Fish Community Survey. Letter with attachments to Mr. Jon Myers - East Bay Municipal Utility District. California Department of Fish and Game. June 5, 1995.
- McMichael, G. and T. Pearsons. 1998. Effects of Wild Juvenile Spring Chinook Salmon on Growth and Abundance of Wild Rainbow Trout. Transactions of the American Fisheries Society, 127:261-274.
- McNeil, W.J. and W.H. Ahnell. 1964. Success of pink salmon spawning relative to size of spawning bed materials. United States Fish and Wildlife Service Special Scientific Report - Fisheries 469.
- Meehan, W.R. and D.N. Swanston. 1977. Effects of gravel morphology on fine sediment accumulation and survival of incubating salmon eggs. United States Forest Service Research Paper PNW-220.
- Meehan, W.R. 1964. A Modified Scoop Trap for Sampling Downstream-Migrant Salmon in Turbid Glacial Rivers. Alaska Department of Fish and Game.
- Meinz, M. 1985. Effects of East Bay Municipal Utility District's dewatering of Mokelumne River on chinook salmon redds. Memorandum report to J. Mensch, Region 2. California Department of Fish and Game. February 25, 1985.
- Meinz, M. 1983. Cosumnes River to Calaveras River. In R.L. Reavis, editor. 1983. Chinook salmon spawning stocks in California's Central Valley. California Department of Fish and Game. Anadromous Fisheries Board Administration Report, 83-2.
- Meinz, M. 1981. American shad (*Alosa sapidissima*), sport fishery in the Sacramento River system 1976-78: Catch and effort. California Department of Fish and Game. Anadromous Fisheries Board Administration Report No. 81-1.
- Meinz, M. 1979a. American shad, *Alosa sapidissima*, sport fishery in the Sacramento River system, 1976-1978: catch and effort. California Department of Fish and Game, Anadromous Fisheries Branch. Administrative Report No. 81-1.
- Meinz, M. 1979b. Young American shad (*Alosa sapidissima*) ecology. Final Report, Job No. 4, Anadromous Fisheries Conservation Act, AFS-17. California Department of Fish and Game.
- Menchen, R.S. 1968. King (chinook) salmon spawning stocks in California's Central Valley, 1967. California Department of Fish and Game, Marine Resources Board Administrative Report No. 68-6.
- Mendel, G., D. Milks, R. Bugert, and K. Petersen. 1992. Upstream passage and spawning of fall chinook salmon in the Snake River, 1991. Washington Department of Fisheries, Olympia, Washington.

- Merz, J.E. 1992. Drift and Benthic Sampling of Macroinvertebrates and Larval Fish and Dietary Pattern and Feeding Behavior Study of Target Fish for the Lower American River, California February-July, 1992. Draft. Department of Biology, California State University, Sacramento.
- Mesa, M.G. 1994. Effects of multiple acute stressors on the predator avoidance and physiology of juvenile chinook salmon. *Transactions of the American Fisheries Society*, 123:786-793.
- Metcalf, N.B. and J.E. Thorpe. 1992. Anorexia and defended energy levels in over-wintering juvenile salmon. *Journal of Animal Ecology*, 61:175-181
- Meyer Resources, Incorporated. 1985. An Analysis of Economic Values of the American River Parkway. Prepared for McDonough, Holland & Allen.
- Michny, F. and M. Hampton. 1984. Sacramento River, Chico Landing to Red Bluff Project 1984 Juvenile Salmonid Study. United States Fish and Wildlife Service, Division of Ecological Services. Prepared for United States Army Corps of Engineers.
- Michny, F. and R. Deibel. 1986. Sacramento River, Chico landing to Red Bluff Project 1985 Juvenile Salmonid Study. United States Fish and Wildlife Service, Division of Ecological Services. Prepared for United States Army Corps of Engineers.
- Michny, F.J., D. Boss and F. Wernette. 1975. Riparian habitats and avian densities along the Sacramento River. California Department of Fish and Game. Wildlife Management Administrative Report No. 75-1.
- Milhous, R.T., D.L. Wegner, and T. Waddle. 1984. User's guide to the Physical Habitat Simulation System (PHABSIM). Instream Flow information Paper 11. Cooperative Instream Flow Service Group, Fort Collins.
- Milhous, R.T., J.M. Bartholow, M.A. Updike, and A.R. Moos. 1990. Instream Flow Information Paper No. 27. Reference manual for the generation of habitat time series-Version II. United States Fish and Wildlife Service, Biological Report 90(16).
- Milhous, R.T., M.A. Updike, and D.M. Schnieder. 1989. Instream Flow Information Paper No. 26. Physical habitat simulation system reference manual-Version II. United States Fish and Wildlife Service, Biological Report 89(16).
- Miller, B., R. Reisenbichler, P. Wampler, C. Burley, D. Leith, B. Thorson, and P. Brandes. 1993. Vision action plan on supplementation, Region 1. United States Fish and Wildlife Service, Region 1. Portland; Oregon.
- Miller, B.A., J.D. Rodgers, and M.F. Solazzi. 2000. An Automated Device to Release Marked Juvenile Fish for Measuring Trap Efficiency. *North American Journal of Fisheries Management*, 20:284-287.
- Miller, T.J., L.B. Crowder, J.A. Rice, and E.A. Marshall. 1988. Larval size and recruitment mechanisms in fishes: toward a conceptual framework. *Canada Journal of Fisheries Aquatic Science*, 46:1657-1670.

- Mills, T.J. and M.S. Pisano. 1989. Capture and Coded-wire Tagging of Naturally Produced Fall Chinook Salmon at Remote Locations Within the Klamath River Basin, 1984-1988. California Department of Fish and Game.
- Miyakoshi, Y. and S. Kudo. 1999. Mark-Recapture Estimation of Escapement of Masu Salmon *Oncorhynchus masou* with a Comparison to a Fence Count. North American Journal of Fisheries Management, 19:1108-1111.
- Miyamoto, J.J. 1989. East Bay Municipal Utility District efforts to improve water quality conditions at the Mokelumne River Fish Facility, Fall 1989. East Bay Municipal Utility District, December 20, 1989.
- Montgomery, D.R., J.M. Buffington, N.P. Peterson, D. Schuett-Hames, and T.P. Quinn. 1996. Streambed scour, egg burial depths, and the influence of salmonid spawning on bed surface mobility and embryo survival. Canadian Journal of Fishery and Aquatic Sciences, 53:1061-1070.
- Mordardt, J.E., D.F. Hanson, and P.J. Coulston. 1983. Instream Flow Increase accuracy using habitat mapping. Pages 1294-1304 in Waterpower "83," Environmental Impacts. Tennessee Valley Authority. An International Conference on Hydropower, Volume 3.
- Morhardt, J.E., and C.F. Mesick. 1988. Behavioral carrying capacity as a possible short term response variable. Hydro Review, 7(2):32-40.
- Morhardt, J.E., D. Bishir, C.I. Handlin, and S.D. Mulder. 2000. A Portable System for Reading Large Passive Integrated Transponder Tags from Wild Trout. North American Journal of Fisheries Management, 20:276-283.
- Mosegaard, H. and R. Titus. 1987. Daily growth rates of otoliths in yolk sac fry of two salmonid species at five different temperatures. Canadian Journal of Fisheries and Aquatic Sciences, 45:1514-1524.
- Mosegaard, H., N.G. Steffner, and B. Ragnarsson. 1987. Manipulation of otolith microstructures as a means of mass-marking salmonid yolk sac fry. In S.O. Kullander and B. Fernholm, editors. Proceedings of the Fifth Congress of European Ichthyologists. 213-220. Stockholm.
- Moskovitz, A. 1994. Significance of Environmental Defense Fund v. East Bay Municipal Utility District Lawsuit: Binding or Precedent Effect of Judge Hodge's Trial Court Decision Environmental Needs and Instream Uses of Lower American River.
- Mosley, M.P. 1982. The highs and lows of braided rivers. Soil and Water, 18:22-23.
- Motroni, R.S. 1984. Seasonal variation of bird numbers in a riparian forest, Sacramento Valley, California. In R. E. Warner and K.M. Hendrix, editors. Proceedings of the California Riparian Systems Conference. University of California - Davis, September 17-19, 1981. University of California Press, Berkeley.
- Moyle, P.B., and C.D. Vanicek. n.d. American River Fish Studies: A Proposal. University of California, Davis, and California State University, Sacramento.
- Moyle, P.B. 1976. Inland fishes of California. University of California Press.

- Moyle, P.B. and B. Vondracek. 1985. Structure and persistence of the fish assemblage in a small California stream. *Ecology*, 66:1-13.
- Moyle, P.B. and D.M. Baltz. 1985. Microhabitat use by an assemblage of California stream fishes: Developing criteria for instream flow determinations. *Transactions of the American Fisheries Society*, 114:695-704.
- Moyle, P.B. and J.J. Cech Jr. 1982. *Fishes: An introduction to ichthyology*. Prentice-Hall. Englewood Cliffs, New Jersey.
- Moyle, P.B. and J.P. Ellison. 1991. A conservation oriented classification system for the inland waters of California. California Department of Fish and Game.
- Moyle, P.B., M.P. Marchetti, J. Baldrige, and T.L. Taylor. n.d. Fish Health and Diversity: Justifying Flows for a California Stream. *Fisheries Management*, 23:6-15.
- Mugiya, Y. 1987. Phase difference between calcification and organic matrix formation in the diurnal growth of otoliths in the rainbow trout, *Salmo gairdneri*. *Fish Bulletin* 85:395-401.
- Mugiya, Y. 1984. Diurnal rhythm in otolith formation in the rainbow trout, *Salmo gairdneri*: seasonal reversal of the rhythm in relation to plasma calcium concentrations. *Comparative Biochemistry and Physiology*, 78A:289-293.
- Mugiya, Y. and K. Takahashi. 1985. Chemical properties of the saccular endolymph in the rainbow trout, *Salmo gairdneri*. *Bulletin of the Faculty of Fisheries, Hokkaido University*, 36:57-63.
- Muir, W.D., A.E. Giorgi, and T.C. Coley. 1994. Behavioral and physiological changes in yearling chinook salmon during hatchery residence and downstream migration. *Aquaculture* 127:69-82.
- Muir, W.D., W.S. Zaugg, A.E. Giorgi, and S. McCutcheon. 1994. Accelerating smolt development and downstream movement in yearling chinook salmon with advanced photoperiod and increased temperatures. *Aquaculture* 123:387-399.
- Munde, J.H. 1969. Ecological implications of the diet of juvenile coho in streams. Pages 213-220 *in* T.G.G. Northcote, editor. *Symposium on salmon and trout in streams*. Institute of Fisheries, University of British Columbia, Vancouver, Canada.
- Munde, J.H. and R.E. Traber. 1983. The carrying capacity of an enhanced side-channel for rearing salmonids. *Canadian Journal of Fisheries and Aquatic Science*, 40:1320-1322.
- Murray, Bums, and Kienlen. 1978. Retention of Riparian Vegetation, Sacramento River, Tisdale Weir to Hamilton City. Prepared for California Department of Water Resources, Reclamation Board.
- Murray, C.B., and J.D. McPhail. 1988. Effect of incubation temperature on the development of five species of Pacific salmon (*Oncorhynchus*) embryos and alevins. *Canadian Journal of Zoology*, 66:266-273.
- Myers, J.A. 1991. American River Phase I Draft Reports. Letter to John G. Williams. East Bay Municipal Utility District. November 1, 1991.

- Myers, J.A. 1995. Environmental Defense Fund v. East Bay Municipal Utility District. Review of Draft Report of the Special Master. East Bay Municipal Utility District. March 8, 1995.
- National Biological Survey. 1993. Growth, Condition and Physiological Performance of Juvenile Salmonids in the American River. A Short Proposal and Budget to Process Fish Collected and Archived in 1993.
- National Marine Fisheries Service. 2000. Endangered and Threatened Species: Threatened Status for One Evolutionarily Significant Unit of Steelhead in California. Proposed Rule. Federal Register (65)29:6960. February 11, 2000.
- National Marine Fisheries Service. 1999. Recovery Planning for West Coast Salmon. National Marine Fisheries Service Northwest and Southwest Regions. October 1999.
- National Marine Fisheries Service. 1998. Draft proposed recommendations for amendment 14 to the Pacific Coast salmon plan for essential fish habitat. March 26, 1995.
- National Marine Fisheries Service. 1995. Proposed recovery plan for Snake River salmon. NMFS, Washington, D.C.
- National Marine Fisheries Service. 1993. Biological opinion for the operation of the federal Central Valley Project and the California State Water Project. Prepared for the United States Bureau of Reclamation.
- National Marine Fisheries Service. 1992. Biological Opinion on Central Valley Project, 1992 Operations.
- National Park Service, Association of State Wetland Managers, and Association of State Floodplain Managers. 1991. A Casebook in Managing Rivers for Multiple Uses. October 1991.
- National Oceanic and Atmosphere Administration. 1976. Local climatological data. Annual summary with comparative data. National Oceanic and Atmosphere Administration, National Climatic Data Center, Asheville, North Carolina.
- Nature Conservancy, The. 1995. 'Sacramento Valley and Foothill Bioregion biological scoping project. August 1995.
- Nawa, R.K. and C.A. Frissell. 1993. Measuring scour and fill of gravel streambeds with scour chains and sliding-bead monitors. North American Journal of Fisheries Management 13:634-639.
- Neilson, J.D. and G.H. Geen. 1981. Methods for preparing otoliths for microstructure examination. Progressive Fish-Culturist, 43:90-91.
- Neilson, J.D. and G.H. Geen. 1985. Effects of feeding regimes and diel temperature cycles on otolith increment formation in juvenile chinook salmon (*Oncorhynchus tshawytscha*). Fish Bulletin, 83:91-101.
- Neilson, J.D. and G.H. Geen. 1986. First-year growth rate of Sixes River chinook salmon as inferred from otoliths: Effects on mortality and age at maturity. Transactions of the American Fisheries Society, 115:28-33.

- Neilson, J.D. and G.H. Geen. 1982. Otoliths of chinook salmon (*Oncorhynchus tshawytscha*): daily growth increments and factors influencing their production. *Canadian Journal of Fisheries and Aquatic Sciences*, 39:1340-1347.
- Neilson, J.D., and C.E. Banford. 1983. Chinook salmon (*Oncorhynchus tshawytscha*) spawner characterizes in relation to redd physical features. *Canada Journal of Zoology*, 61:1524-1531.
- Neitzel, D.A. and C.D. Becker. 1985. Tolerance of eggs, embryos, and alevins of chinook salmon to temperature changes and reduced humidity in dewatered redds. *Transactions of the American Fisheries Society*, 114:267-273.
- Neitzel, D.A. Scott, M.J., Sjakle, S.A. and J.C. Chatters. 1991. The effect of climate change on stream environments: The salmonid resource of the Columbia River basin. *The Northwest Environmental Journal*, 7:271-293
- Nelson, J., B. Somer, and M. Fjelstad. 1989. Lower Mokelumne River Survey, October 1989. File Report to the California Department of Fish and Game, **Region 2**.
- Nelson, W.R., L.K. Friedenberg, and D.W. Rondorf. 1994. Swimming performance of subyearling chinook salmon. *In* D.W. Rondorf and W.H. Miller. Eds. Identification of the spawning, rearing, and migratory requirements of fall chinook salmon in the Columbia River Basin. National Biological Service 1992 Annual Report to the Bonneville Power Administration, Portland, OR.
- Newman, M.A. 1956. Social behavior and inter-specific competition in *two* trout species *Physiological Zoology*, 29:64-81.
- Nielsen, J.D., T.E. Lisle and V. Ozaki. 1994. Thermally stratified 'pools and their use by steelhead in northern California streams. *Transactions of the American Fisheries Society* 121:613-626.
- Odenweller, D.B. 1981. Screening agricultural diversions in the Sacramento-San Joaquin estuary and its tributaries, a review of the problem. California Department of Fish and Game.
- Okihiro, **MS.**, D.J. Ostrach, and D.E. Hinton. 1992. American River Study. Preliminary Report. University of California, School of Veterinary Medicine.
- O'Leary, J.A. and B. Kynard. 1986. Behavior, length, and sex ratio of seaward-migrating juvenile American shad and blueback herring in the Connecticut River.
- Olson, P.A., R.E. Nakatania, and T. Meekin. 1970. Effects of thermal increments on eggs and young of Columbia River fall chinook. National Technical Information Service **BNWL-1538**.
- Olson, P.A. and R.F. Foster. 1955. Temperature tolerance of eggs and young of Columbia River chinook salmon. *Transaction of the American Fisheries Society*, 203-207. Eighty-fifth Annual Meeting, September 14-16, 1955.
- Orchard, R.D. 1988. New method for measuring water seepage through salmon spawning gravel. United States Forest Service, Research Note PNW-483.

- Ordal, E.J., and R.E. Pacha. 1963. The effects of temperature on disease in fish. 12th Symposium on Water Pollution Research, Pacific North West. Water Laboratory, Corvallis, Oregon.
- Oregon Department of Fish and Wildlife. 1997. Oregon Plan for Salmon and Watersheds. Draft Supplement on Steelhead. December 1997.
- Oregon Department of Forestry and Oregon Department of Fish and Wildlife. 1995. A Guide to Placing Large Wood in Streams. May 1995
- Orsi, J.J. 1971. Thermal shock and upper lethal temperature tolerances of young king salmon, *Oncorhynchus tshawytscha*, from the Sacramento-San Joaquin River system. California Department of Fish and Game and Fisheries Administrative Branch, Administrative Report, 71-11.
- Orsi, J.J. 1992. Long-term trends in abundance of native zooplankton in relation to Delta outflow in the Sacramento-San Joaquin estuary. California Department of Fish and Game, State Water Resources Control Board 1992 Bay-Delta proceedings, Sacramento, CA.
- Orth, D.J. 1987. Ecological considerations in the development and application of instream flow-habitat models. Regulated Rivers: Research & Management, 1:171-181.
- Orth, D.J. 1983. Aquatic Habitat Measurement. pages 61-84 *in* L.A. Nielsen and D.L. Johnson, editors. Fisheries Techniques. American Fisheries Society. Bethesda, Maryland Publishing.
- Osborne, L.L., M.J. Wiley, and R.W. Larimore. 1988. Assessment of water surface profile model: Accuracy of predicted instream fish habitat conditions in low-gradient, warmwater streams. Regulated Rivers: Research & Management, 2:619-631.
- Ott Water Engineers, Incorporated. 1987. American River Water Temperature Modeling.
- Pacific Gas and Electric Company. 1993. DeSabra-Centerville Project, two-year water temperature and stream flow monitoring study.
- Painter, R.E. 1979. Population parameters for adult American shad (*Alosa sapidissima*) in Central California. Final Report, Job No. 3. United States Department of Interior, Fish and Wildlife Service, Anadromous Fisheries Conservation Act.
- Painter, R.E., L.H. Wixom, and M. Meinz. 1979. American shad management plan for the Sacramento River drainage. Final Report, Job No. 5. California Department of Fish and Game. Anadromous Fisheries Conservation Act.
- Painter, R.E., L.H. Wixom, and M. Meinz. 1980. Management plan for American shad (*Alosa sapidissima*) in central California. Final Report Job No. 3. Anadromous Fish Conservation Act, Project No. AFS-17. California Department of Fish and Game.
- Painter, R.E., L.H. Wixom, and S.N. Taylor. 1977. An evaluation of fish populations and fisheries in the post-Oroville Project, Feather River. A report submitted to the California Department of Water Resources in accordance with Federal Power Commission License No. 2100. California Department of Water Resources.

- Pannella, G. 1971. Fish otoliths: Daily growth layers and periodical patterns, *Science*, 173:1124-1126.
- Parenskiy, V.A. 1990. Relation between the spawning success of sockeye salmon *Oncorhynchus nerka* and behavior on spawning grounds. *Journal of Ichthyology*, 30(1):4848-58.
- Pares-Sierra, A. and J.J. O'Brien. 1989. The seasonal and interannual variability of the California current system: A numerical model. *Journal of Geophysical Research*, 94:3159-3180
- Parfitt, D.G. 1981. Upper Sacramento River Baseline Study – Hydrology, Geology, and Gravel Resources. California Department of Water Resources, Northern District.
- Parfitt, D.G.. 1980. Upper Sacramento River Spawning Gravel Study. California Department of Water Resources, Northern District.
- Parisot, T.J. and J. Pelnar. 1962. Sacramento River chinook disease: A virus-like disease of chinook salmon. An interim report. *Progressive Fish-Culturist*, 24:51-55.
- Parker, R.R. and P.A. Larkin. 1959. A concept of growth in fishes. *Journal of the Fisheries Research Board of Canada*, 16:721-745
- Pauley, G.B., B.M. Bortz, and M.F. Shepard. 1986. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates Pacific Northwest—steelhead trout. Biological Report. Prepared for United States Fish and Wildlife Service, Washington, D.C., and United States Army Corps of Engineers.
- Payne, T.R. & Associates. 1991. Initial Report of the Independent Review Committee, American River Fishery and Aquatic Resource Investigations. Letter to John G. Williams, American River Special Master. December 10, 1991.
- Pearcy, W.G. 1992. Ocean Ecology of North Pacific Salmonids. University of Washington Press, Seattle, Washington.
- Pennington, M. 1983. Efficient estimators of abundance, for fish and plankton surveys. *Biometrics*, 39:281-286.
- Perry, J.N. and L.R. Taylor. 1986. Stability of real interacting populations in space and time: implications, alternatives, and the negative binomial k_s . *Journal of Animal Ecology*, 55:1053-1068.
- Peterman, R.M. 1990. Statistical power analysis can improve fisheries research and management. *Canadian Journal of Fisheries and Aquatic Sciences*, 47:2-15.
- Peters, J.C. n.d. Effects of River and Streamflow Alteration on Fishery Resources
- Petersen, J.H. and D.L. Ward. 1999. Development and Corroboration of a Bioenergetics Model for Northern Pikeminnow Feeding on Juvenile Salmonids in the Columbia River. *Transactions of the American Fisheries Society*, 128:784-801.

- Peterson, N.P. and T.P. Quinn. 1996. Spatial and temporal variation in dissolved oxygen in natural egg pockets of chum salmon, Kennedy Creek, Washington. *Journal of Fish Biology*, 48:131-143.
- Pielou, E.C. 1977. *Mathematical Ecology*. John Wiley and Sons, New York.
- Platts, W.S. 1974. Geomorphic and aquatic conditions influencing salmonids and stream classification with applications to ecosystem management. SEAM Program. United States Department of Agriculture. Billings, Montana.
- Platts, W.S. 1975. Relationships among stream order, fish populations, and aquatic geomorphology in an Idaho river drainage. *Fisheries*, 4:5-9.
- Platts, W.S. and R.L. Nelson. 1988. Fluctuations in trout populations and their implications for land-use evaluation. *North American Journal of Fisheries Management*, 8(3):333-345.
- Platts, W.S., W.F. Megahan, and G.W. Minshall. 1983. Methods for evaluating stream, riparian, and biotic conditions. General Technical Report INT-138. United States Forest Service Intermountain Forest and Range Experimental Station.
- Pollard, R.A. 1955. Measuring seepage through salmon spawning gravel. *Journal of the Fisheries Research Board of Canada*, 12(5):706-741.
- Prokopovich, N.P., and K.A. Nitzberg. 1982. Placer Mining and Salmon Spawning in American River Basin, California. *Bulletin of the Association of Engineering Geologists*. Volume XIX, No. 1, pp. 67-76.
- Public Utility District No. 1 of Douglas County and Public Utility District No. 1 of Chelan County. 1998. The Anadromous Fish Agreements and Habitat Conservation Plans for the Wells, Rocky Reach, and Rock Island Hydroelectric Projects.
- Puckett, L.K., and R.N. Hinton. 1974. Some measurements of the relationship between streamflow and king salmon spawning gravel in the main Eel and South Fork Eel Rivers. California Department of Fish and Game, Environmental Services Division, Administrative Report No. 74-1.
- Quad Consultants. 1990. Fairbairn Water Treatment Plan Expansion Project Draft Environmental Impact Report. Prepared for City of Sacramento Department of Public Works, Water Division.
- Quigley, T.M. 1981. Estimating contributions of overstory vegetation to stream surface shade. *Wildlife Society Bulletin*, 9(1):22-27.
- Quinn, T. and D. Adams. 1995. Migratory timing of American shad and sockeye salmon: adaptation to environmental change. Manuscript in preparation. University of Washington, Seattle.
- Radtko, L.D. 1966. Distribution and abundance of adult and subadult striped bass, *Morone saxatilis*, in the Sacramento-San Joaquin Delta. Pages 15-27 in J.L. Turner and D.W. Kelley (eds.), *Ecological studies of the Sacramento-San Joaquin Delta, Part II*. California Department of Fish and Game. Fish Bulletin 136.

- Railsback, S.F. 1999. Bioenergetics Modeling of Stream Trout Growth: Temperature and Food Consumption Effects. Transactions of the American Fisheries Society, 128:241-256.
- Raleigh, R.F., T. Hickman, R.C. Solomon, and P.C. Nelson. 1984. Habitat suitability information: rainbow trout. United States Fish and Wildlife Service. FWS/OBS-82/10.60.
- Raleigh, R.F., W.J. Miller, and P.C. Nelson. 1986. Biological Report: Habitat Suitability index models and instream flow suitability curves: chinook salmon. United States Fish and Wildlife Service, 10(10.122).
- Rankel, G.L. 1980. Depleted Chinook Salmon Runs in the Klamath River Basin: Causes, Consequences and Constraints on Management, United States Fish and Wildlife Service. Fisheries Assistance Office, Arcata, California.
- Rantz, S.E., et al. 1982. Measurement and computation of streamflow, Volume 1. Measurement of stage and discharge. United States Geological Survey Water Supply Paper 2175.
- Raymond, H.L. 1988. Effects of hydroelectric development and fisheries enhancement on spring and summer chinook and steelhead in the Columbia River basin. North American Journal of Fisheries Management, 8:1-24.
- Raymond, H.L. 1979. Effects of dams and impoundments on migrations of juvenile chinook salmon and steelhead from the Snake River, 1966 to 1975. Transactions of the American Fisheries Society, 108:505-529.
- Reavis, R.L. 1981. Chinook (king) salmon spawning stocks in California's Central Valley, 1979. California Department of Fish and Game, Anadromous Fisheries Branch. Administrative Report 81-4.
- Reavis, R.L. 1983. Annual report: Chinook salmon spawning stocks in California Central Valley, 1981. California Department of Fish and Game, Anadromous Fisheries Branch. Administrative Report No. 83-2.
- Reavis, R.L. 1986. Annual report: Chinook salmon spawning stocks in California's Central Valley, 1983. California Department of Fish and Game, Anadromous Fisheries Branch. Administrative No. 86-01.
- Reisenbichler, R.R. 1986. Use of spawner-recruit relations to evaluate the effect of degraded environment and increased fishing on the abundance of fall-run chinook salmon, *Oncorhynchus fshawytscha*; in several California streams. United States Fish and Wildlife Service. Seattle, Washington.
- Reisenbichler, R.R., J.D. McIntyre, and R.J. Hallock. 1982. Relationship between size of chinook salmon, *Oncorhynchus fshawytscha*, released at hatcheries and returns to hatcheries and ocean fisheries. California Department of Fish and Game, 68:57-59.
- Reiser, D.W. and R.G. White. 1990. Effects of streamflow reduction on chinook salmon egg incubation and fry quality. Rivers, 1:110-118.

- Reiser, D.W. and R.G. White. 1988. Effects of two sediment size-classes on survival of steelhead and chinook salmon eggs. *North American Journal of Fisheries Management*, 8:432-437.
- Reiser, D.W. and R.G. White. 1983. Effects of complete redd dewatering on salmonid egg-hatching success and development of juveniles. *Transactions of the American Fisheries Society*, 112:532-540.
- Reiser, D.W. and T.C. Bjornn. 1979. Habitat requirements of anadromous salmonids. General Technical Report PNW-96. United States' Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland.
- Reiser, D.W., T.A. Wesche, and C. Estes. 1989. Status of instream flow legislation and practices. Pages 22-29 *In* *North America Fisheries*.
- Resh, V.H. 1979. Sampling variability and life history features: Basin considerations in the design of aquatic insect studies. *Journal of the Fisheries Research Board of Canada*, 36:290-311.
- Resource Management International, Incorporated. 1990. Draft American River Hydrologic Analysis Concerning the Expansion of the Fairbairn Water Treatment Plant.
- Reuter, J.E., and W.T. Mitchell. 1987. Spring Water Temperatures of the Sacramento River. Prepared by D.W. Kelley & Associates for the California Department of Water Resources. July 1987.
- Reynolds, F., T.J. Mills, R. Benthin, and A. Low. 1993a. Central Valley anadromous fisheries and associated riparian and wetland areas protection and restoration action plan. California Department of Fish and Game, Inland Fisheries Division.
- Reynolds, F., S.J. Mills, R. Benthin, and A. Low. 1993b. Restoring Central Valley Streams: A Plan for Action. California Department of Fish and Game, Inland Fisheries Division. November 1993.
- Reynolds, F.L., R.L. Reavis, and J. Schuler. 1990. Central Valley salmon steelhead restoration and enhancement plan. California Department of Fish and Game.
- Rice, J.A. 1987. Reliability of age and growth rate estimates derived from otolith analysis. Pages 167-176 *In* R.C. Summerfelt and G.E. Hall, Editors, *The age and growth of fish*. Iowa State University Press, Ames.
- Rich, A.A. 1997. Testimony Regarding Water Right Applications for the Delta Wetlands Project Proposed by Delta Wetland Properties for Water Storage on Webb Tract, Bacon Island, Bouldin island, and Holland Tract in Contra Costa and San Joaquin counties. Submitted by California Department of Fish and Game. July 1997.
- Rich, A.A. 1985. Re-evaluation of fall chinook salmon (*Oncorhynchus tshawytscha*) spawning escapement estimates in the lower American River, California. Prepared for McDonough, Holland, & Allen.
- Rich, A.A. and G.R. Leidy. 1985. Evaluation of Instream Flow Requirements for Fall Chinook Salmon (*Oncorhynchus tshawytscha*) in the American River, California. Prepared for McDonough Holland & Allen. February 14, 1985.

- Rich, A.A. and W.E. Loudermilk. 1991. Preliminary Evaluation of Chinook Salmon Smolt Quality in the San Joaquin Drainage. California State Resources Agency, California Department of Fish and Game.
- Rich, W.H. and H.B. Holmes. 1928. Experiments in marking young chinook salmon on the Columbia River. 1916-1927. Bulletin of the United States Bureau of Fisheries, 44:215-264.
- Rich, W.S. 1920. Early history and seaward migration of chinook salmon in the Columbia and Sacramento Rivers. Bulletin of the United States Bureau of Fisheries, 37:1-74.
- Richardson, T. 1984. Literature Review on Impacts of High Water Temperature on Salmonid Egg and Fry Survival.
- Richardson, T. 1987. An analysis of the effectiveness of the mitigation plan for Shasta and Keswick dams. File report. United States Fish and Wildlife Service, Division of Ecological Services.
- Ricker, W.E. 1958. Handbook of computations for biological statistics of fish populations. Bulletin of the Fisheries Research Board of Canada, 119.
- Ricker, W.E. 1975. Computation and interpretation of biological statistics in fish populations. Bulletin 191. Department of the Environmental Fisheries and Marine Service. Ottawa, Ontario.
- Ricker, W.E. 1980. Causes of the decline in age and size of chinook salmon (*Oncorhynchus tshawytscha*). Canadian Technical Report of Fisheries and Aquatic Sciences No. 944. Department of Fisheries and Oceans. Nanaimo, British Columbia.
- Ricker, W.E. 1976. Review of the rate of growth and mortality of Pacific salmon in salt water, and noncatch mortality caused by fishing. Journal of the Fisheries Research Board of Canada, 33:1483-1524.
- Ricker, W.E. 1979. Growth rates and models. Pages 677-743 *in* W.S. Hoar, D.J. Randall, and J. R. Brett, editors, Fish Physiology. Volume 8, Bioenergetics and Growth. Academic Press, New York.
- Riley, C. 1982. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1981-82. California Department of Fish and Game.
- Riley, C. 1980. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1979-80. California Department of Fish and Game.
- Riley, C. 1979. Annual Report: Nimbus Salmon and Steelhead Hatchery. Fiscal Year 1977-78. California Department of Fish and Game.
- Roberts, C. 2000. Science and Technical Analyses in Impact Assessments and Mitigation Processes under CEQA and NEPA. Functional Impact Assessment and Mitigation. Presented at the 2000 ELS Conference. March 17, 2000.
- Roberts, B.C. and R.G. White. 1992. Effects of angler wading on survival of trout eggs and pre-emergent fry. North American Journal of Fisheries Management, 12:450-459.

- Roberts, W.G., J.G. Howe, and J. Major. 1977. A survey of riparian forest flora and fauna in California. *In* A. Sands, editor. Riparian forests in California: Their ecology and conservation. Institute of Ecology Publication No. 15. University of California, Davis.
- Robison, E.G., A. Mirati, and M. Allen. 1999. Oregon Road/Stream Crossing Restoration Guide: Spring 1999. Advanced Fish Passage Training Version. June 8, 1999.
- Rowell, J.H. 1990. Monthly Temperature Model Sacramento River Basin. Draft Report. United States Bureau of Reclamation.
- Sacramento Area Flood Control Agency. 2000a. Flood Control Improvements Along the Mainstem of the American River, Volume I. Draft Program Environmental Impact Report. Prepared by Jones & Stokes and Surface Water Resources, Incorporated. April 2000.
- Sacramento Area Flood Control Agency. 2000b. Flood Control Improvements Along the Mainstem of the American River, Volume II. Draft Program Environmental Impact Report. Prepared by Surface Water Resources, Incorporated. April 2000.
- Sacramento Area Flood Control Agency. 1999a. Lower American River aerial map atlas and velocity contour plots RM 0 to RM 12. Prepared by Ayres Associates. November 5, 1999.
- Sacramento Area Flood Control Agency. 1990. American River Watershed Investigation Project. Consensus Final Report.
- Sacramento City-County Office of Metropolitan Water Planning. 1999. Development of a River Corridor Management Plan for the Lower American River.
- Sacramento City-County Office of Metropolitan Water Planning. 1992. Study Plan for the State Water Resources Control Boards Review of Water Rights on the American River. Final Draft.
- Sacramento County Water Agency. 1999. Cold-water Pool Management Model for Folsom Reservoir. Prepared by Surface Water Resources, Incorporated. November 1999.
- Sacramento County Water Agency. 1999. Public meeting agenda regarding East Bay Municipal Utility District's Draft Amendatory Central Valley Project Water Service Contract (with handout). January 27, 1999.
- Sacramento River Advisory Council. 1998. Draft Sacramento River Consideration Area Handbook. Prepared for the Resources Agency. May 1998.
- Sacramento River information Center. 1993. Toxic pollution of the Sacramento River. Research Report No. 1.
- Sacramento Water Forum. 1994. Issues and Interest of Environmental Caucus.
- Saiki, M.K. 1991a. Location of Sampling Sites Selected for Monitoring Juvenile Chinook Salmon and Juvenile Steelhead in Lower American River. Letter to Jon Myers, East Bay Municipal Utility District. United States Department of the Interior, United States Fish and Wildlife Service. April 12, 1999.

- Saiki, M.K. 1991b. Monthly Status Report with attachments for April 1991. Letter to Jon Myers, East Bay Municipal Utility District. United States Department of the Interior, United States Fish and Wildlife Service. May 21, 1991.
- Saiki, M.K. 1991c. National Fisheries Contaminant Research Center American River Project Monthly Station Report. Letter to Jon Myers, East Bay Municipal Utility District. United States Department of the Interior, United States Fish and Wildlife Service. May 31, 1991.
- Sakihiro, M. S., D.J. Ostrach, and D.E. Hinton. 1992. American River juvenile chinook salmon and steelhead histological and morphometric evaluation. Unpublished report to Environmental Defense Fund v. East Bay Municipal Utility District parties. School of Veterinary Medicine, University of California, Davis.
- Saltveit, S.J. 1990. Effect of decreased temperature on growth and smoltification of juvenile Atlantic salmon (*Salmo salar*) and brown trout (*Salmo trutta*) in a Norwegian regulated river. *Regulated Rivers: Research and Management*, 5:294-303
- San Francisco Estuary Project. 1993. Comprehensive Conservation and Management Plan. June 1993.
- San Joaquin River Management Program Advisory Council. 1992. San Joaquin River Management Program second annual report to the legislature.
- San Joaquin River Management Program Fisheries Subcommittee. 1993. An action plan for San Joaquin fall-run chinook salmon populations. Prepared for the San Joaquin River Management Program Advisory Council.
- Sanders, S. D., E. C. Beedy, R. F. Holland, V. Dains, and A. Sands. 1985. Vegetation and Wildlife Resources Along the Lower American River and their Relationships to Instream Flows. Prepared for McDonough, Holland & Allen. February 13, 1985.
- Sands, A. 1985. Aesthetics of the Lower American River Parkway. Prepared for McDonough Holland & Allen on behalf of Sacramento County. September 3, 1985.
- Sands, A. 1986. Response to East Bay Municipal Utility District Exhibit 43 Assessment of Channel and Riparian Vegetation Conditions, Lower American River, California. Prepared for McDonough Holland & Allen.
- Sands, A. 1985. Algae as Indicators of Water Quality and Flow in the Lower American River. Prepared for McDonough, Holland & Allen.
- Sands, A. 1985. American River Parkway Riparian Vegetation and Wildlife Testimony. Prepared for State Water Resources Control Board.
- Sands, A., S.D. Sanders, R.F. Holland, and E.C. Brady. 1985. Exhibits in Support of Testimony on Instream Flow Requirements for the Riparian Corridor of the American River California.
- Santa Ynez River Consensus Committee. 1999a. Lower Santa Ynez River Fish Management Plan. Volume I, Management Plan. Public Review Draft. Prepared by the Santa Ynez River Technical Advisory Committee. April 1999.

- Santa Ynez River Consensus Committee. 1999b. Lower Santa Ynez River Fish Management Plan. Volume II, Appendices. Public Review Draft. Prepared by the Santa Ynez River Technical Advisory Committee. April 1999.
- Save the American River Association Board. 1990. Draft Resolution.
- Scammell-Tinling, J. and United States Fish and Wildlife Service. 1990. American River Watershed Investigations, Lower American River Area, Substantiating Report; Volume III, Appendix: Habitat Evaluation Procedure.
- Schaefer, M.B. 1951. Estimation of the size of animal populations by marking experiments. United States Fish and Wildlife Service Fish Bulletin, 52:189-203.
- Schneidervin, R.W. and W.A. Hubert. 1986. A rapid technique for otolith removal from salmonids and catostomids. North American Journal of Fisheries Management, 6:287.
- Schuster, D. 1993. Comments on Draft Technical Section Special Masters Report 1991 and 1992. Letter to John G. Williams. June 24, 1993.
- SEC. 1998. Potter Valley Project Monitoring Program (FERC No. 77, Article 39): Effects of operations on upper Eel River anadromous salmonids. Final Report. Steiner Environmental Consulting. March 1998.
- Seber, G.A.F. 1973. The Estimation of Animal Abundance and Related Parameters. Griffin, London.
- Secor, D.H. and J.M. Dean. 1989. Somatic growth effects on the otolith-fish size relationship in young pond-reared striped bass, *Morone saxatilis*. Canadian Journal of Fisheries and Aquatic Sciences, 46:113-121.
- Seelbach, P.W., R.N. Lockwood, and G.R. Alexander. 1985. A modified inclined-screen trap for catching salmonid smolts in large river. North American Journal of Fisheries Management, 5:494-498.
- Semenchenko, N.N. 1988. Mechanisms of innate population control in sockeye salmon, *Oncorhynchus nerka*. Journal of Ichthyology, 28(3):149-157.
- Sequeira, J. 1997. Comments on Proposed Rule to List West Coast Steelhead under the Endangered Species Act. Letter, and attachments, to Garth Griffin, National Marine Fisheries Service, Northwest Region. January 6, 1997.
- Seymour, A. H. 1956. Effects of temperature upon young chinook salmon. Doctoral thesis. University of Washington, Seattle.
- Shanks, R. 1998. Draft Environmental Impact Report/Environmental Impact Statement for the East Bay Municipal Utility District Supplemental Water Supply Project. Letter to Kurt Ladensack, Water Supply Improvement Division, East Bay Municipal Utility District. Sacramento Regional County Sanitation District. February 1998.
- Shapovalov, L., and R. Taft. 1954. The life histories of the steelhead rainbow trout (*Salmo gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management. California Department of Fish and Game. Fish Bulletin 98.

- Shelbourn, J.E., Brett, J.R., and S. Shirahata. 1973. Effect of temperature and feeding regime on the specific growth rate of sockeye salmon fry (*Oncorhynchus nerka*), with a consideration of size effect. *Journal of the Fisheries Research Board of Canada*, 30:1191-1194
- Shepherd, J.G., Pope, J.G. and R.D. Cousens. 1988. Variations in fish stocks and hypotheses concerning their links with climate. *Rapp. P-v Cons. Int. Explor. Mer.*, 185:255-267
- Shirazi, M.A., W.K. Siem, and D.H. Lewis. 1981. Characterization of spawning gravel and stream system evaluation. Pages 227-2078 *In* Proceedings Conference on Salmon Spawning Gravel: A Renewable Resource in the Pacific Northwest. Water Research Center Report 39. Washington State University, Pullman.
- Shirvell, C.S. 1986. Pitfalls of physical habitat simulation in the instream flow incremental methodology. *Canadian Technical Report of Fisheries and Aquatic Sciences*, 1460.
- Shirvell, C.S. 1989. Ability of PHABSIM to predict chinook salmon spawning habitat. *Regulated Rivers: Research and Management*, 3:277-289.
- Siegel, S. 1956. *Nonparametric statistics for the behavioral sciences*. McGraw-Hill, New York, 127-136.
- Simmons, P.S. 1995. Sacramento County's comments on the Draft Report of Special Master, Water Years 1990-1993. Letter to John G. Williams. March 1, 1995.
- Simonds, W.J. 1994. The Central Valley Project, The American River Division, The Folsom and Sly Park Units, The Auburn-Folsom South Unit: Research on Historic Reclamation Projects. Second Draft. United States Bureau of Reclamation History Program. Denver, CO.
- Simpson, R.G. 1972. Determination of channel capacity of the Mokelumne River downstream from Camanche Dam, San Joaquin and Sacramento Counties. Open File Report, United States Geological Survey, Menlo Park, California.
- Sinervo, B. Doughty, P., Huey, R.B., and K. Zamudio. 1992. Allometric engineering: A causal analysis of natural selection on offspring size. *Science*, 258:1927-1930
- Smith, F.E. 2000. Concerns regarding renewable public trust resources and the Lower American River. Email communication to Surface Water Resources, Inc. March 15, 2000.
- Smith, F.E. 1999. Modified proposal of June 4, 1999 to East Bay Municipal Utility District and the purpose and intent of the Hodge physical condition. Fax transmittal to City-County Office of Metropolitan Water Planning, S. Sherry, and Environmental Caucus. June 7, 1999.
- Smith, F.E. 1998. Purpose and Intent of Fish and Game Code Section 5937 and In Good Condition. Prepared for the California Sportfishing Protection Alliance. August 1998.
- Smith, F.E. 1996. Letter to Dennis M. Diemer, East Bay Municipal Utility District, Environmental Defense Fund. May 12, 1996.

- Smith, F.E. 1994. The Lower American River, the Public Trust and, in Good Condition. Prepared for the California Sportfishing Protection Alliance. June 1994.
- Smith, F.E. 1991a. The Lower American River Always Changing. Presented at the 1991 American River Conference. June 1, 1991.
- Smith, F.E. 1991b. Lower American River Flows. Letter to Walter G. Pettit, State Water Resources Control Board. February 7, 1991.
- Smith, F.E. 1990a. Concern about the State Board Orders in Response to the Notice of Petition Filed by the Placer County Water Agency.
- Smith, F.E. 1990b. State Board Orders in response to the Notice of Petition. Letter to State Water Resources Control Board. November 7, 1990.
- Smith, F.E. 1990c. The State of the American River. Presentation at the annual meeting of Save the American River Association. October 20, 1990.
- Smith, F.E. 1976. Water development impact on fish resources and associated values of the Trinity River, California *In* Orsborn, J.F. and Allman, C.H. editors, Instream Flow Needs, Volume 2, Western Division of the American Fisheries Society, Boise.
- Snelling, J.C., and six authors. 1992. Migratory characteristics of spring chinook salmon in the Willamette River. Oregon Cooperative Fishery Unit, Oregon State University. Corvallis.
- Snider, B. 1997. Quarterly Report (January - March 1997). Cooperative Agreement 6-FC-20-14140 concerning determination of threshold flow and ramping flow rates required to protect lower American River fishery resources. Letter to the United States Bureau of Reclamation. California Department of Fish and Game. April 7, 1997.
- Snider, B. 1995. Lower American River emigration survey, November 1993-July 1994. California Department of Fish and Game.
- Snider, B. 1994. Letter to John G. Williams. California Department of Fish and Game. March 31, 1994.
- Snider, B. 1993a. Comments on the Draft Report Growth: Condition, and Physiological Performance of Juvenile Salmonids from the Lower American River: February through July 1992. California Department of Fish and Game.
- Snider, B. 1993b. Results of Sampling Conducted on the Lower American River subsequent to the Contract Period that Ended July 1992. California Department of Fish and Game.
- Snider, B. 1993c. Sampling Results of the Lower American River. Letter to John G. Williams. California Department of Fish and Game. January 13, 1993.
- Snider, B. 1993d. Status Reports for the Fish Community Survey. Letter to Jon Myers, East Bay Municipal Utility District. California Department of Fish and Game. March 29, 1993.
- Snider, B. 1992a. Comments on the Proposed 1992-1993 Study Program for the Lower American River. Letter to Paul Bratovich, Beak Consultants, dated August 25, 1992. California Department of Fish and Game. August 25, 1992.

- Snider, B. 1992b. Double Sampling Procedure Description, 1992 Lower American River Redd Survey. Letter to Beak Consultants, Incorporated. September 24, 1992.
- Snider, B. 1992c. Emigration Survey Lower American River 1992. California Department of Fish and Game. Stream Flow and Habitat Evaluation Program. Environmental Services Division. July 1992.
- Snider, B. 1992d. Fish Community and Macroinvertebrate. California Department of Fish and Game.
- Snider, B. 1991. Fish community and macroinvertebrate survey. Outline and cost proposal, Prepared for the Technical Advisory Committee for the Lower American River.
- Snider, B. 1987. Chinook Salmon Smolt Production Survey, Lower American River. Outline and Cost Proposal. Prepared for the Technical Advisory committee for the Lower American River.
- Snider, B. and R. Titus. 2000. Lower American River Emigration Survey October 1996-September 1997. Stream Evaluation Program Technical Report No. 00-2. California Department of Fish and Game, Habitat Conservation Division. January 2000.
- Snider, B. and K. Bandner. 1996a. Lower American River Chinook Salmon Escapement Survey, October 1994-January 1995. California Department of Fish and Game. Environmental Services Division. January 1996.
- Snider, B. and K. Bandner. 1996b. Lower American River Spawner Escapement Survey, Fall 1994. California Department of Fish and Game.
- Snider, B. and B. Reavis. 1996. Lower American River Chinook Salmon Escapement Survey: October 1995 - January 1996. California Department of Fish and Game, Environmental Services Division. July 1996.
- Snider, B. and R. Titus. 1996. Fish Community Survey, Lower American River, January through June 1995. California Department of Fish and Game, Environmental Services Division. April 1996.
- Snider B. and K. Vyverberg. 1996. Chinook Salmon Redd Survey, Lower American River, Fall 1995. California Department of Fish and Game, Environmental Services Division, Stream Flow and Habitat Evaluation Program. May 1996.
- Snider, B. and R. Reavis. 1995. Lower American River spawning escapement survey, fall 1995. California Department of Fish and Game, Environmental Services Division.
- Snider, B. and R.G. Titus. 1995. Fish Community Survey, Lower American River, November 1993-July 1994. California Department of Fish and Game, Environmental Services Division. August 1995.
- Snider, B., and R.G. Titus. 1995. Lower American River Emigration Survey: November 1993-July 1994. California Department of Fish and Game, Environmental Sciences Division, Stream Flow and Habitat Evaluation Program. August 1995.

- Snider, B. and K. Vyverberg. 1995. Chinook Salmon Redd Survey, Lower American River, Fall 1993. California Department of Fish and Game, Environmental Services Division, Stream Flow and Habitat Evaluation Program. February 1995.
- Snider, B. and N. Keenan. 1994. Fish Community Survey, Lower American River, January through June 1993. Final Report. California Department of Fish and Game. May 1994.
- Snider, B. and R. Titus. 1994. Fish Community Survey, Lower American River, January-July 1994. California Department of Fish and Game, Environmental Services Division.
- Snider B. and D. McEwan. 1993. Fish Community Survey, Lower American River, February-July 1992. Final Report. California State Resources Agency, California Department of Fish and Game. January 1993.
- Snider, B. and Beak Consultants, Incorporated. 1992. Habitat characterization of the lower American River. Prepared for the California Department of Fish and Game, Environmental Services Division.
- Snider, B. and D. McEwan. 1992. Chinook Salmon and Steelhead Trout Redd Survey Lower American River, 1991-1992. Final Report. California Department of Fish and Game, Stream Evaluation Program. Environmental Services Division. July 1992.
- Snider, B. and E. Gerstung. 1986. Instream flow requirements of the fish and wildlife resources of the lower American River, Sacramento County, California. Report No. 86-1. California Department of Fish and Game.
- Snider, B. and K. Vyverberg. n.d. Lower American River gravel evaluation study. California Department of Fish and Game. Environmental Services Division.
- Snider, B., B. Reavis, and S. Hill. 1999. 1998 Upper Sacramento River Winter-Run Chinook Salmon Escapement Survey, May-August 1998. California Department of Fish and Game, Water and Aquatic Habitat Conservation Branch. March 1999.
- Snider, B., B. Reavis, and S. Hill. 1999. Upper Sacramento River Fall-Run Chinook Salmon Escapement Survey, September-December 1998. California Department of Fish and Game, Habitat Conservation Division. May 1999.
- Snider, B., R.G. Titus, and B.A. Payne. 1998. Lower American River Emigration Survey: October 1995-September 1996. California Department of Fish and Game, Environmental Sciences Division, Stream Evaluation Program. September 1998.
- Snider, B., R.G. Titus, and B.A. Payne. 1997a. Lower American River Emigration Survey: November 1994-September 1995. Draft Report. California Department of Fish and Game, Environmental Sciences Division, Stream Evaluation Program. July 1997.
- Snider, B., R.G. Titus, and B.A. Payne. 1997b. Lower American River Emigration Survey: November 1994-September 1995. Final Report. California Department of Fish and Game, Environmental Sciences Division, Stream Evaluation Program. September 1997.
- Snider, B., K. Vyverberg, and S. Whiteman. 1996. Chinook Salmon Redd Survey, Lower American River, Fall 1994. California Department of Fish and Game, Environmental Services Division, Stream Flow and Habitat Evaluation Program. January 1996.

- Snider, B., A. Chappelle, and N. Villa. 1995. Lower American River Chinook Salmon Escapement Survey, October 1993-January 1994. California Department of Fish and Game, Environmental Services Division. December 1995.
- Snider, B., N. Keenan, and M. Munos. 1993. Lower American River Chinook Salmon Escapement Survey, September 1992-1993. Draft.
- Snider, B., D. McEwan, K. Urquhart, and M. Munos. 1993. Chinook Salmon Redd Survey, Lower American River, 1992.
- Snider, B., K. Urquhart, D. McEwan, and M. Munos. 1993. Chinook Salmon Redd Survey, Lower American River, 1991-1992. California Department of Fish and Game, Environmental Services Division, Stream Flow and Habitat Evaluation Program.
- Sohl, J. 1999. Comments on Modified Proposal, June 4, 1999. Fax transmittal to Felix Smith. Save the American River Association. June 4, 1999.
- Somerville, P.N. 1958. Tables for obtaining non-parametric tolerance limits. *An Math. Stat.*, 29: 599-601.
- Sommer, T., R. Baxter, B. Herbold. 1997. Resilience of Splittail in the Sacramento-San Joaquin Estuary. *Transactions of the American Fisheries Society*, 126:961-976.
- Sowden, T.K. and G. Power. 1985. Prediction of rainbow trout embryo survival in relation to groundwater seepage and particle size of spawning substrates. *American Fisheries Society*, 114:804-812.
- Speed, T. 1993. Modeling and Managing a Salmon Population. University of California, Berkeley.
- Staley, J.R. 1976. American River steelhead (*Salmo gairdner*) management 1956-1974. California Department of Fish and Game. Anadromous Fisheries Administrative Report 76-2.
- Stalnaker, C. 1989. Trinity River Habitat Population Modeling United States Department of the Interior, Fish and Wildlife Service.
- Stanford, J.A., and J.V. Ward. 1979. Stream regulation in North America. Pages 215-236 *In* J.V. Ward and J.A. Stanford, editors, *The Ecology of Regulated Streams*. Plenum Press, New York.
- State of Oregon. 1999. Oregon Aquatic Habitat Restoration and Enhancement Guide. May 1999.
- State Water Resources Control Board. 1990. Workplan: Review of Water Rights on the American River. August 1990.
- Stein, R.A., M.T. Bremigan, and J.M. Dettmers. 1996. Understanding reservoir systems with experimental tests of ecological theory: a prescription for management. Pages 12-22 *In*: L.E. Miranda and D.R. DeVries, editors. *Multidimensional approaches to reservoir fisheries management*. American Fisheries Society, Symposium 16, Bethesda, Maryland.

- Steir, D.J. and J.H. Crance. 1985. Habitat suitability index models and instream flow suitability curves: American shad. United States Fish and Wildlife Service Biological Report 82[10.88]. National Coastal Ecosystems Team, Slidell, LA.
- Stephens, D.W. and J.R. Krebs. 1986. Foraging theory. Princeton University Press, New Jersey.
- Stem, D.H. and M.S. Stem. 1980. Effects of Bank Stabilization on the Physical and Chemical Characteristics of Streams and Small Rivers: An Annotated Bibliography. United States Fish and Wildlife Service. July 1980.
- Stevens, D.E. 1966. Distribution and food habits of the American shad, *Alosa sapidissima*, in the Sacramento-San Joaquin Delta. In J.L. Turner and D.W. Kelley editors. Ecological studies of the Sacramento-San Joaquin Delta, Part II, Fishes of the Delta. California Department of Fish and Game, Fish Bulletin, 136:97-107.
- Stober, Q.J., S.C. Crumley, D.E. Fast, E.S. Killebrew, R.M. Woodin, G. Engman, and G. Tutmark. 1982. Effects of Hydroelectric Discharge Fluctuation on Salmon and Steelhead in the Skagit River. Final Report. Washington State Department of Game.
- Stober, Q.J., S.C. Crumley, D.E. Fast, E.S. Killebrew, and R.M. Woodin. 1981. The effects hydroelectric discharge fluctuations on salmon and steelhead survival in the Skagit River, Washington. University of Washington School of Fisheries, Fisheries Research Institute.
- Stone, T.B. 1976a. Observations of Furbearers within the Riparian Habitat of the Upper Sacramento River. Memorandum Report. California Department of Fish and Game.
- Stone, T.B. 1976b. Birds in Riparian Habitat of the Upper Sacramento River. Memorandum Report. California Department of Fish and Game. November 1976.
- Strange, E.M., P.B. Moyle and T.C. Foin. 1992. Interactions between stochastic and deterministic processes in stream fish community assembly. Environmental Biology of Fishes, 36:1-15.
- Stromberg, J.C. 1995. Fremont Cottonwood Growth in Relation to American River Stream Flow and Groundwater Depth.
- Stuart, T.A. 1953. Water currents through permeable gravels and their significance to spawning salmonids. Nature, 172:407-408
- Studley, T.K., J.E. Baldrige, and S.F. Railsback. 1996. Predicting fish population response to instream flows. Hydro Review, 15(6):48-57.
- Studley, T.K. and ten coauthors. 1995. Response of fish populations to altered flows project, volumes 1-11, predicting trout populations from streamflow and habitat variables. Pacific Gas and Electric Company, Report 009.4-94.3, San Ramon, California.
- Sullivan, K. n.d. Hydraulics and fish habitat in relation to channel morphology. Doctorate dissertation. Johns Hopkins University, Baltimore, Maryland.

- Sumner, F.H. and O.R. Smith. 1940. Hydraulic mining and debris dams in relation to fish life in the American and Yuba rivers of California. California Department of Fish and Game, 26:2-22.
- Superior Court of the State of California. 1990a. Environmental Defense Fund vs. East Bay Municipal Utility District. Case No. 425955. Order Regarding Special Master and Procedures with Respect to the Court's Continuing Jurisdiction.
- Superior Court of the State of California. 1990b. Statement of Decision. Environmental Defense Fund, Inc., et al, vs. East Bay Municipal Utility District, et al. Case No. 425955. January 2, 1990.
- Surface Water Resources, Inc. 1999. Effects of Interim Reoperation of Folsom Dam and Reservoir on the Availability of Potential Splittail Spawning Habitat in the Lower American River. Draft Report prepared for the Sacramento Area Flood Control Agency. June 1999.
- Surface Water Resources, Inc. 1997. Review of March 13 LAR Technical Team Meeting. March 13, 1997.
- Surface Water Resources, Inc., Jones & Stokes Associates, and Bookman-Edmonston Engineering, Inc. 2000. Expert Testimony on Yuba River Fisheries Issues. Prepared for the California State Water Resources Control Board.
- Sutton, S.G., T.P. Bult, and R.L. Haedrich. 2000. Relationships among Fat Weight, Body Weight, Water Weight, and Condition Factors in Wild Atlantic Salmon Parr. Transactions of the American Fisheries Society, 129:527-538.
- Swan, G.A. 1989. Chinook salmon spawning surveys in deep waters of a large, regulated river. Regulated Rivers: Research and Management 4:355-370.
- Sykes, S.D. and L.W. Botsford. 1986. Chinook salmon, *Oncorhynchus tshawytscha*, spawning escapement based on multiple mark-recapture of carcasses. Fishery Bulletin, 84(2): 261-270.
- Tappel, P.D. and T.C. Bjornn. 1983. A new method of relating size of spawning gravel to salmonid embryo survival, North American Journal of Fisheries Management, 3:123-135.
- Taylor, E.B. 1990. Environmental correlates of life-history variation in juvenile chinook salmon (*Oncorhynchus tshawytscha*, Walbaum). Journal of Fish Biology, 37:1-17.
- Taylor, E.B. 1988. Water temperature and velocity as determinants of microhabitat of juvenile chinook and coho salmon in a laboratory stream channel. Transactions of the American Fisheries Society, 117:22-28.
- Taylor, S.N. 1994. King (chinook) Salmon Spawning Stocks in California's Central Valley, 1973. California State Resources Agency, California Department of Fish and Game. Administrative Report No. 74-12.
- Taylor, S.N. 1976. King (Chinook) Salmon Spawning Stocks in California's Central Valley, 1974. California State Resources Agency, California Department of Fish and Game.

- Taylor, S.N. 1974. King (chinook) Salmon Spawning Stocks in California's Central Valley, 1972. California State Resources Agency, California Department of Fish and Game. Administrative Report No. 74-6.
- Tebo, L.B., Jr. 1974. Review of selected parameters of trout stream quality. *In* symposium on trout habitat research and management. Appalachian Consortium Press. Boone, North Carolina. Pages 20-32. *In* D.W. Reiser and T.C. Bjornn. Habitat requirements of anadromous salmonids. United States Forest Service, Pacific Northwest Forest and Range Experimental Station, Portland.
- Tebo, L.B., Jr. 1957. Effects of siltation on trout streams. General Technical Report PNW-96, Society American Forestry Proceedings 1956 meeting. Pages 198-202 *In* D.W. Reiser and T.C. Bjornn. Habitat requirements of anadromous salmonids. United States Department of Agriculture Forest Service, Pacific Northwest Forest and Range Experimental Station, Portland, Oregon.
- Technical Advisory committee for the Lower American River. 1993. Management of Lower American River Fisheries Investigations.
- Technical Advisory Committee for the Lower American River. 1991. Draft **Scope** of Work element for American River Fisheries Studies Task Group. November 22, 1991.
- Technical Advisory Committee for the Lower American River. 1991. Notes from July 26 meeting regarding Lower American River 1991 and 1992 studies.
- Technical Advisory Committee for the Lower American River. 1990. Draft Proposed Plan of Work. September 12, 1990.
- Tenera Environmental Services. 1990. Draft Proposal to East Bay Municipal Utility District and Sacramento County Regarding Fisheries Studies Related to the Environmental Defense Fund v. East Bay Municipal Utility District Physical Solution in the American River During 1990 and 1991. Fax Transmittal to Beak Consultants, Incorporated. October 3, 1990.
- Terhune, L.B.D. 1958. The Mark VI groundwater standpipe for measuring seepage through salmon spawning gravel.. *Journal of the Fisheries Research Board of Canada*, 15(5):1027-1063
- Theurer, F.D., K.A. Voos, and W.J. Miller. 1984. Instream water temperature model. Instream Flow Information Paper 16. United States Fish and Wildlife Service. FWS/OBS-84/15.
- Thomas J.A. and K.D. Bovee. 1993. Application and testing of a procedure to evaluate transferability of habitat suitability criteria. *Regulated Rivers: Research and Management* 3:277-289.
- Thompson, A.L. 1992a. Comments on Draft Agreement Between County and the California Department of Fish and Game. Letter to Beak Consultants. East Bay Municipal Utility District. February 3, 1992.
- Thompson, A. L. 1992b. Review Comments on United States Fish and Wildlife Second Draft Report Entitled "Growth, Condition, and Physiological Performance of Juvenile Salmonids from the Lower American River: February Through July 1992." East Bay Municipal Utility District. November 30, 1992.

- Thompson, A.L. 1993a. Review Comments on Department of Fish and Game Draft Report for the Chinook Salmon Redd Survey Study. East Bay Municipal Utility District. November 12, 1993.
- Thompson, A.L. 1993b. Review Comments on Draft Report for 1991 and 1992. Letter to Dr. John G. Williams. East Bay Municipal Utility District. June 16, 1993.
- Thompson, K. 1972. Determining stream flows for fish life: Procedure. Instream Flow Requirements Workshop. 31-46. Portland, Oregon, March 15-16, 1972.
- Tiffan, K.F., D.W. Rondorf, and P.G. Wagner. 2000. Physiological Development and Migratory Behavior of Subyearling Fall Chinook Salmon in the Columbia River. North American Journal of Fisheries Management, 20:28-40.
- Tiffan, K.F. and P.G. Wagner. 1994. Osmoregulatory performance and marking of subyearling chinook salmon at McNary Dam to estimate adult contribution. In Rondorf, D.W. and K.F. Tiffan, eds. Identification of the spawning, rearing, and migratory requirements of fall chinook salmon in the Columbia River Basin. National Biological Service 1993 Annual Report to the Bonneville Power Administration, Portland, OR.
- Tippets, W.E., and P.B. Moyle. 1978. Partitioning of energy into metabolism and growth. pages 184-214 In S.D. Gerking, editor. Biology of freshwater fish production. John Wiley & Sons, New York.
- Titus, R. 1994. Status Reports on lower American River seining survey. Letter with attachments to John G. Williams. California Department of Fish and Game. April 21, 1994.
- Townsend, C.R., and A.G. Hildrew. 1976. Field experiments on the drifting, colonization, and continuous redistribution of stream benthos. Journal of Animal Ecology, 45:759-772.
- Trihey, E.W. and D.S. Wegner. 1981. Field data collection procedures for use with the Physical Habitat Simulation System of the Instream Flow Group. Cooperative Instream Flow Service Group, Fort Collins.
- Trinity River Flow Evaluation Staff. 1988. Annual Report, Trinity River Flow Evaluation. United States Fish and Wildlife Service.
- Trotzky, H.M. and R.W. Gregory. 1974. The effects of water flow manipulation below a hydroelectric power dam on the bottom fauna of the Upper Kennobbee River Main Channel. Transactions of the American Fisheries Society, 103:318-324.
- Tsumara, K. and J.M. B. Hume. 1986. Two variations of a salmonid smolt trap for small rivers. North American Journal of Fisheries Management, 6:272-276.
- Turner, J.L. 1995. Review of the Special Master Report for Water Years 1990-1993. Letter to John Williams, Special Master. California Department of Fish and Game. March 6, 1993.
- Turner, J.L. 1993a. January Progress Reports for Salmon Redd and Escapement Surveys on the Lower American River. Letter to Keith DeVore-Water Resource Division, Department of Public Works. California Department of Fish and Game, Environmental Services Division. February 19, 1993.

- Turner, J.L. 1993b. December Progress Report for the Salmon Redd and Escapement Surveys Conducted on the Lower American River. California Department of Fish and Game.
- Turner, J.L. 1992a. April Status Report for the Chinook Salmon and Steelhead Trout Surveys being Conducted on the Lower American River. California Department of Fish and Game.
- Turner, J.L. 1992b. March Progress Report for the Chinook Salmon and Steelhead Trout Surveys being Conducted on the Lower American River. California Department of Fish and Game.
- Turner, J.L. 1992c. May Progress Report for the Community Fish Surveys being conducted on the Lower American River.
- Turner, J.L. 1992d. November Progress Reports for Salmon Redd and Escapement Surveys on the Lower American River. Letter to Beak Consultants, Incorporated. California Department of Fish and Game, Environmental Services Division. December 17, 1992.
- Turner, J.L. 1992e. Preliminary Status Report—March 1992. Chinook Salmon and Steelhead Trout Redd Survey Lower American River Results. California Department of Fish and Game.
- Turner, J.L. 1992f. Status Report—April 1992. Community Fish Survey Lower American River. California Department of Fish and Game.
- Turner, J.L. 1992g. Status Report—April 1992. Preliminary Chinook Salmon and Steelhead Trout Redd Survey Lower American River Results. California Department of Fish and Game.
- Turner, J.L. 1992h. Status Report—February 1992. Community Fish Survey Lower American River. California Department of Fish and Game.
- Turner, J.L. 1992i. Status Report—June 1992. Community Fish Survey Lower American River. California Department of Fish and Game.
- Turner, J.L. 1992j. September-October Progress Reports for the Salmon Redd and Escapement Surveys Conducted on the Lower American River. California Department of Fish and Game.
- Turner, J.L. 1992k. Status Report of the Emigration Survey Lower American River. California Department of Fish and Game.
- United States Army Corps of Engineers. 1994. Alternatives Report. American River Watershed, California.
- United States Army Corps of Engineers. 1992a. Folsom Dam and Reservoir Reoperation, California. Appendixes Draft Report.
- United States Army Corps of Engineers. 1992b. Folsom Dam and Reservoir Reoperation, California. Operation Plan and Environmental Impact Statement Draft Report.

- United States Army Corps of Engineers. 1991a. American River Watershed Investigation, California. Draft Feasibility Report, Volume 1, Appendixes A-J.
- United States Army Corps of Engineers. 1991b. American River Watershed Investigation, California. Draft Feasibility Report, Volume 4, Appendixes N-Q.
- United States Army Corps of Engineers. 1991c. American River Watershed Investigation, Draft Feasibility Report. Part I and II.
- United States Army Corps of Engineers. 1991d. American River Watershed Investigation, California. Draft Feasibility Report. Volume 2, Appendixes F-L.
- United States Army Corps of Engineers. 1991e. American River Watershed Investigation, California. Draft Feasibility Report. Volume 3, Appendixes K-M.
- United States Army Corps of Engineers. 1991f. American River Watershed Investigation, California. Draft Feasibility Report. Volume 5, Appendixes O-R.
- United States Army Corps of Engineers. 1991g. American River Watershed Investigation, California. Feasibility Report.
- United States Army Corps of Engineers. 1991h. Existing Fisheries and Wildlife Conditions for the Sacramento/Trinity River Reach, American River Reach, and Sacramento-San Joaquin Delta.
- United States Army Corps of Engineers. 1991i. Special Study on the Reoperation of Folsom Dam and Reservoir, California.
- United States Army Corps of Engineers. 1989. Information Paper on Alternatives. American River Watershed, California.
- United States Army Corps of Engineers. 1984. Sacramento River Aerial Atlas.
- United States Army Corps of Engineers. 1980. Sacramento River Aerial Atlas.
- United States Army Corps of Engineers. 1975. Wild, Scenic, and Recreational Characteristics, Sacramento River, California, Keswick Dam to Sacramento.
- United States Army Corps of Engineers and Oregon Department of Fish and Wildlife. 2000a. Effects of Lost Creek Dam on Spring Chinook Salmon in the Rogue River. Phase II Completion Report. Volume I. Rogue Basin Fisheries Evaluation Project. February 2000.
- United States Army Corps of Engineers and Oregon Department of Fish and Wildlife. 2000b. Effects of Lost Creek Dam on Spring Chinook Salmon in the Rogue River. Phase II Completion Report. Volume II. Rogue Basin Fisheries Evaluation Project. February 2000.
- United States Army Corps of Engineers and The Reclamation Board. 1999a. Sacramento and San Joaquin River Basins Comprehensive Study. Interim Report. March 1999.

- United States Army Corps of Engineers and The Reclamation Board. 1999b. Sacramento and San Joaquin River Basins Comprehensive Study. Phase I Documentation Report. March 1999.
- United States Army Corps of Engineers and The Reclamation Board. 1999c. Sacramento and San Joaquin River Basins Comprehensive Study. Phase I Documentation Report Appendices. March 1999.
- United States Army Corps of Engineers and The Reclamation Board. 1992. Programmatic Environmental Impact Statement/Environmental Impact Report. Sacramento River Flood Control System Evaluation. Phases II-V.
- United States Bureau of Land Management. 1986. Sacramento River Area Management Plan. Draft Report.
- United States Bureau of Reclamation. 1994. American River Water Resources Investigation. Draft, Volume 1. and II.
- United States Bureau of Reclamation. 1993. American River Water Resources Investigation. Working Document for Water-related Needs Assessment.
- United States Bureau of Reclamation. 1992. Biological Assessment. United States Bureau of Reclamation, 1992, Central Valley Project Operations.
- United States Bureau of Reclamation. 1992. Interim Central Valley Project Operations Criteria and Plan.
- United States Bureau of Reclamation. 1991. Appendices to Shasta Outflow Temperature Control Planning Report/Environmental Impact Statement.
- United States Bureau of Reclamation. 1988. American River Service Area Water Contracting Program. Draft Environmental Impact Statement.
- United States Bureau of Reclamation. 1986a. Central Valley Fish and Wildlife Management Study. Alternative Solutions to the Heavy Metal Toxicity Problem, Spring Creek Basin, California. Special Report.
- United States Bureau of Reclamation. 1986b. Central Valley Fish and Wildlife Management Study. Evaluation of the Benefits and Costs of Improving the Anadromous Fishery of Clear Creek, California. Special Report.
- United States Bureau of Reclamation. 1985. Central Valley Fish and Wildlife Management Study. Fishery Problems at Red Bluff Diversion Dam and Tehama-Colusa Canal Fish Facilities. Special Report.
- United States Bureau of Reclamation. 1984. Central Valley Fish and Wildlife Management Study. A Concept for Resolving Wildlife Habitat, Recreation Access, and Crop Damage Problems, Sacramento River Riparian Zone, California. Special Report.
- United States Bureau of Reclamation. 1983a. Central Valley Fish and Wildlife Management Study. Fishery Problems at Anderson-Cottonwood Irrigation District Diversion Dam, Sacramento River, California. Special Report.

- United States Bureau of Reclamation. 1983b. Central Valley Fish and Wildlife Management Study. Predation of Anadromous Fish in the Sacramento River, California. Special Report.
- United States Bureau of Reclamation. 1983c. Coleman National Fish Hatchery and Keswick Fish Trap. Study Manager's Draft. Special Report.
- United States Bureau of Reclamation. 1972. Auburn--Folsom/South Unit Central Valley Project, United States Department of the Interior.
- United States Bureau of Reclamation. n.d. Amendatory Contract Between the United States and East Bay Municipal Utility District Providing for Project Water Service.
- United States Bureau of Reclamation. n.d. Assumptions and Criteria Utilized in the Operations, Power Temperature and Water Quality Models. Appendix F.
- United States Bureau of Reclamation and United States Fish and Wildlife Service. 1999. Central Valley Project Improvement Act Draft Programmatic Environmental Impact Statement.
- United States Congress. 1985. Upper Sacramento River Fisheries and Riparian Habitat Management Plan. Senate Bill 1086. March 7, 1985
- United States Congress. 1949. American River Basin Development Act of 1949. October 14, 1949.
- United States Congress. 1944. Flood Control Act of 1944. December 22, 1944.
- United States Department of Agriculture. 1974. Forest Service Southeastern Forest Experiment Station, Western Carolina University, Appalachian Consortium, Tennessee Valley Authority. Proceedings of the Symposium on Trout Habitat Research and Management. Appalachian Consortium Press. September 5-6, 1974.
- United States Environmental Protection Agency, Atomic Energy Commission, National Marine Fisheries Service. 1971. Columbia River Thermal Effects Study Volume I: Biological Effects Study.
- United States Environmental Protection Agency. 1986. Quality criteria for water 1986. EPA 440/5-86-001-Update #2.
- United States Fish and Wildlife Service and the California Department of Fish and Game. 1953. A plan for the protection and maintenance of salmon and steelhead in the American River, California, together with recommendations for actions.
- United States Fish and Wildlife Service. 2000. Anadromous Fish Restoration Actions in the Butte Creek Watershed. Draft Programmatic Environmental Assessment. Prepared for the Sacramento-San Joaquin Estuary Fishery Resource Office, U.S. Fish and Wildlife Service, Stockton. February 2000.
- United States Fish and Wildlife Service. 1998. Annual Report. Comprehensive Assessment and Monitoring Program (CAMP). 1995-1997. Central Valley Fish and Wildlife Restoration Program.

- United States Fish and Wildlife Service. 1997. Revised draft Anadromous Fish Restoration Plan: a plan to increase natural production of anadromous fish in the Central Valley of California. May 30, 1997.
- United States Fish and Wildlife Service. 1996. Comprehensive Assessment and Monitoring Program (CAMP). Draft Implementation Plan. October 1996.
- United States Fish and Wildlife Service. 1995. Working Paper on Restoration Needs. Central Valley Project Improvement Act /Anadromous Fish Restoration Program.
- United States Fish and Wildlife Service. 1994. Effects of the Central Valley Project and State Water Project on Delta Smelt and Sacramento Splittail. Biological Assessment: Prepared by California Department of Water Resources and United States Bureau of Reclamation. August 1994.
- United States Fish and Wildlife Service. 1992. Shaded Riverine Aquatic Cover of the Sacramento River System: Classification as a Resource Category I under the United States Fish and Wildlife Service Mitigation Policy. Mitigation Policy Resource Category 1 Determination Approval. United States Fish and Wildlife Service, Sacramento, California. October 1992.
- United States Fish and Wildlife Service. 1991a. American River Watershed Investigation Lower American River Area Supplemental Analysis of Construction Impacts.
- United States Fish and Wildlife Service. 1991b. Substantiating Report. American River Watershed Investigation. Lower American River Area. Volume III.
- United States Fish and Wildlife Service. 1991c. Valley Elderberry Longhorn Beetle Habitat and Distribution in the American River Watershed Study Area.
- United States Fish and Wildlife Service. 1990a. American River Watershed Investigation. Lower American River Area.
- United States Fish and Wildlife Service. 1990b. Planning Aid Letter. Folsom Dam and Reservoir Reoperation Study.
- United States Fish and Wildlife Service. 1987. The needs of chinook salmon, *Oncorhynchus tshawytscha*, in the Sacramento-San Joaquin Estuary. Exhibit 31 for the State Water Resources Control Board 1987, Water Quality/Water Rights Proceeding on the San Francisco Bay/Sacramento-San Joaquin Delta.
- United States Fish and Wildlife Service. 1986. Glenn-Colusa Irrigation District Diversions and the Sacramento River Fishery. Report No. 4.
- United States Fish and Wildlife Service. 1985a. Final report on the 1981 lower American River flow study. Flow needs of chinook salmon in the lower American River: United States Fish and Wildlife Service, Division of Ecological Services. Prepared for the United States Bureau of Recreation, Mid-Pacific Region.
- United States Fish and Wildlife Service. 1985b. Recommended Flows for the Lower American River. Table 14.

- United States Fish and Wildlife Service. 1984a. A supplemental detailed report on the Auburn-Folsom South Unit-Lower American River Alternatives Central Valley Project. Division of Ecology Service
- United States Fish and Wildlife Service. 1984b. Coleman National Fish Hatchery. Station Development Plan. Division of Engineering.
- United States Fish and Wildlife Service. 1984c. Riparian Vegetation Protection Program. An Appraisal Level Study. Prepared for the U.S. Army Corps of Engineers, Sacramento River and Tributaries Bank Protection and Erosion Control Investigation.
- United States Fish and Wildlife Service. 1984d. Valley Elderberry Longhorn Beetle Recovery Plan. United States Fish and Wildlife Service.
- United States Fish and Wildlife Service. 1976. Fish and Wildlife Management Plan for Sacramento River Bank Protection Project, California. Regarding the U.S. Corps of Engineers' Sacramento River Bank Protection Project. May 1976.
- United States Fish and Wildlife Service and United States Bureau of Reclamation. 1997. Final Administrative Proposal on the Management of Section 3406(b)(2) Water. November 20, 1997.
- Upper Sacramento River Fisheries and Riparian Habitat Advisory Council. A report prepared for the California State Resources Agency. 1989. Upper Sacramento River Fisheries and Riparian Habitat Management Plan. January 1989.
- Upper Sacramento River Salmon and Steelhead Advisory Committee. 1983. Red Bluff Diversion Dam and the Tehama-Colusa Fish Facility. Report NO. 1.
- Upper Sacramento River Salmon and Steelhead Advisory Committee. 1984. Coleman National Fish Hatchery. Report No. 2.
- Upper Sacramento River Salmon and Steelhead Advisory Committee. n.d. Chico Landing to Red Bluff Project. Report No. 3.
- Upper Sacramento River Salmon and Steelhead Advisory Committee. 1986. Glenn-Colusa Irrigation District Diversions and the Sacramento River Fishery. Report No. 4.
- Ursin, E. 1967. A mathematical model of some aspects of fish growth, respiration, and mortality. Journal of the Fisheries Research Board of Canada, 24:2355-2453.
- Utter, F., Milner, G., Stahl, G., and D. Teel. 1989. Genetic population structure of chinook salmon *Oncorhynchus tshawytscha*, in the Pacific Northwest. Fish Bulletin 87:239-264
- Van Deventer, J.S. and W.S. Platts. 1983. Sampling and estimating fish populations from streams. Transactions of the North American Wildlife and Natural Resources Conference, 48:349-354.
- Vanoni, V.A. editor. 1975. Sedimentation Engineering. American Society of Civil Engineers, New York.

- Vigg, S. and C.C. Burley. 1991. Temperature dependent maximum daily consumption of juvenile salmonids by northern squawfish (*Ptychocheilus oregonensis*) from the Columbia River. Canadian Journal of Fisheries and Aquatic Sciences, 48:2491-2498.
- Volk, E.C., S. L. Schroder, and K. L. Fresh. 1989. Inducement of Unique Otolith Banding Patterns as a Practical Means to Mass-Mark Juvenile Pacific Salmon. American Fisheries Society Symposium, 7:203-215.
- Vyverberg, K., B. Snider, and R. G. Titus. 1997. Lower American River Chinook Salmon Spawning Habitat Evaluation, October 1994. An Evaluation of Attributes Used to Define the Quality of Spawning Habitat. California Department of Fish and Game. The Stream Flow Habitat Evaluation Program. Environmental Services Division. May 1997.
- Wagner, E.J., T. Bosakowski, and S. Intelmann. 1997. Combined Effects of Temperature and High pH on Mortality and the Stress Response of Rainbow Trout after Stocking. Transactions of the American Fisheries Society, 126:985-998.
- Wagner, H.H. 1974. Photoperiod and temperature regulation of smolting in steelhead trout (*Salmo gairdner*). Canadian Journal of Zoology, 52:219-234.
- Walker Associates and Brown and Caldwell. 1994. Sacramento Coordinated Water Quality Monitoring Program. 1993 Annual Report. Appendices A-I.
- Walters, C. 1986. Adaptive Management of Renewable Resources. MacMillan Publishing Company, New York, NY.
- Wang, Johnson C.S. 1986. Fishes of the SacramentoSan Joaquin Estuary and Adjacent Waters, California: A Guide to the Early Life Histories. Technical Report 9, Interagency Ecological Studies Program for the SacramentoSan Joaquin Estuary.
- Waples, R.S. and six coauthors. 1993. A genetic monitoring and evaluation..program for supplemented populations of salmon and steelhead in the Snake River basin. Annual Report to the Bonneville Power Administration, Portland, Oregon.
- Ward, J.V. 1976. Effects of flow patterns below large dams on stream benthos: a review. Pages 235-253 In J.F. Orsborn and C.H. Allman, editors. Instream flow needs. Western Division, American Fisheries Society, Volume 2. Bethesda, Maryland.
- Ward, J.V., and J.A. Stanford. 1979. Ecological factors controlling stream zoobenthos with emphasis on thermal modification of regulated streams. Pages 35-55 In J.V. Ward and J.A. Stanford, editors. The ecology of regulated streams. Plenum Press, New York.
- Water Education Foundation. 1988. The Layperson's Guide to the American River.
- Water Resources Control Board. 1991. Final Draft Compiled Revisions to the January 1991 Draft Water Quality Control Plan for Salinity in the Bay-Delta Estuary.
- Water Supply Management Program Board. 1995. American River Briefing Paper.
- Watson, C. 1985. Assessment of Channel and Riparian Vegetation Conditions Lower American River, California. East Bay Municipal Utility District Exhibit #43.

- Watson, C. 1985. Review of Water Depth and Velocity Criteria for Instream Recreation, Lower American River, California.
- Wedemeyer, G.A., R. L. Saunders, and W. C. Clarke. 1980. Environmental Factors Affecting Smoltification and Early Marine Survival of Anadromous Salmonids. Marine Fisheries Review.
- Welch, D.W. 1999. Written testimony to the Committee on Energy and Natural Resources, United States Senate. June 9, 1999.
- Wentworth, C.K. 1922. The shape of pebbles. United States Geological Survey Bulletin 730-C:19-114
- Werner, E.E., J.F. Gilliam, D.J. Hall, and G.G. Mittelback. 1983. An experimental test of the effects of predation risk on habitat use in fish. Ecology, 64:1540-1548.
- West Coast Steelhead Biological Review Team 1997. Status review update for deferred and candidate ESUs of west coast steelhead. National Marine Fisheries Service.
- Whalen, K., D. Parrish, and S. McCormick. 1999. Migration Timing of Atlantic Salmon Smolts Relative to Environmental and Physiological Factors. Transactions of the American Fisheries Society, 128:289-301.
- Wheatley, J.Y. 1903. The Polar Planimeter and Its Use in Engineering Calculations. Keuffel and Esser Company, New York.
- White, J.R. and H.W. Li. 1985. Determination of the energetic cost of swimming from the analysis of growth rate and body composition in juvenile chinook salmon (*Oncorhynchus tshawytscha*). Comprehensive Biochem. Physiol., 81A:25-33.
- White, W.S. 1998. Comments on the Draft Environmental Impact Report/Environmental Impact Statement for East Bay Municipal Utility District's Supplemental Water Supply Project. Memorandum to United States Bureau of Reclamation, North-Central California Area Office. United States Fish and Wildlife Service. March 23, 1998.
- White, W.S. 1992. CE-Folsom Dam and Reservoir Temporary Reoperation Study, American River, California: Fish and Wildlife Coordination Act Report.
- White, W.S. 1990. Assumptions for Application to a Temperature Mortality Model for Chinook Salmon of the Sacramento River. Prepared for the United States Bureau of Reclamation.
- Whitmore, C.M., C.E. Warren, and P. Doudoroff. 1960. Avoidance reactions of salmonids and centrarchid fishes to low oxygen concentrations. General Technical Report PNW-96. Transactions of the American Fisheries Society 89(1):17-26. In D.W. Reiser and T.C. Bjornn. 1979. Habitat requirements of anadromous salmonids. United States Department of Agriculture, Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.
- Willdan Associates and J.H. Turner. 1994. American River Water Resources Investigation, California. Overview of Alternative Plans of Action in the Investigation Study Area.

- Williams, F.M. 1984. Research Project Technical Completion Report A-059-PA. A fish population model for instream flow assessment. Institute for Research on Land & Water Resources. Pennsylvania State University. University Park.
- Williams, J.G. 1996a. Comments on Draft Letter considered in April 26, 1996 meeting. April 24, 1996.
- Williams, J.G. 1996b. Comments on Draft Scope of Work for performing a comprehensive technical evaluation and integration of lower American River fishery information obtained since 1990. Letter to California Department of Fish and Game, Hydrologic Consultants, Incorporated and Hanson Environmental, Incorporated. April 25, 1996.
- Williams, J.G. 1996c. Comments on the Draft Scope of Work. Fax transmittal to Bill Snider, California Department of Fish and Game, Beak Consultants, Incorporated, and Hanson Environmental, Incorporated. April 17, 1996.
- Williams, J.G. 1996d. Lost in space: minimum confidence intervals for idealized PHABSIM studies. Transactions of the American Fisheries Society 125:458-465.
- Williams, J.G. 1996e. Special Master's Report for February 1996. July 7, 1996.
- Williams, J.G. 1995a. Report of the Special Master John G. Williams. Alameda County Superior Court No. 425955. Environmental Defense Fund v. East Bay Municipal Utility District. Water years 1990-1993. May 1995.
- Williams, J.G. 1995b. Report of the Special Master John G. Williams. Alameda County Superior Court No. 425955. Environmental Defense Fund v. East Bay Municipal Utility District. Water years 1990-1993. Appendices 1 and 2. May 1995.
- Williams, J.G. 1995c. Report of the Special Master John G. Williams. Alameda County Superior Court No. 425955. Environmental Defense Fund v. East Bay Municipal Utility District. Water years 1990-1993. Appendices 3 and 4. May 1995.
- Williams, J.G. 1995d. Workshop on Flow Standards. Draft Transcript. April 7, 1995.
- Williams, J.G. 1994a. Comments on the Fish Community Survey Report. Letter to Bill Snider.
- Williams, J.G. 1994b. Draft Report of the Special Master John G. Williams. Alameda County Superior Court No. 425955. Environmental Defense Fund v. East Bay Municipal Utility District. Water years 1990-1993.
- Williams, J.G. 1994c. Environmental Defense Fund v. East Bay Municipal Utility District. Technical Committee. Letter to unknown parties. January 27, 1994.
- Williams, J.G. 1994d. Environmental Defense Fund v. East Bay Municipal Utility District. Technical Committee. Letter to unknown parties. March 23, 1994.
- Williams, J.G. 1994e. Environmental Defense Fund v. East Bay Municipal Utility District. Technical Committee. Letter to unknown parties. April 1, 1994.
- Williams, J.G. 1994f. Environmental Defense Fund v. East Bay Municipal Utility District. Technical Group. Letter to unknown distribution list. June 24, 1994.

- Williams, J.G. 1994g. Environmental Defense Fund v. East Bay Municipal Utility District Liaison Group. Letter to unknown distribution list. September 9, 1994.
- Williams, J.G. 1994h. Flow schedules. Letter to the California Department of Fish and Game, Region 2. October 19, 1994.
- Williams, J.G. 1993a. Additional thoughts on the relevance of the physiological studies to flow standards. Letter to unknown distribution *list*.
- Williams, J.G. 1993b. Comments on the Revised 1992/93 Lower American River Study Program.
- Williams, J.G. 1993c. Draft comments for the seeping of the Environmental Impact Statement on the Central Valley Project Improvement Act. Fax transmittal to Beak Consultants, Incorporated. April 4, 1993.
- Williams, J.G. 1993d. Draft Technical Sections, Special Master's Report for 1991 and 1992.
- Williams, J.G. 1993e. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. January 22, 1993.
- Williams, J.G. 1993f. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. February 22, 1993.
- Williams, J.G. 1993g. Feasibility of Video Monitoring of Adult Chinook Salmon Migration. Draft letter to Technical Advisory Committee for the Lower American River.
- Williams, J.G. 1993h. Liaison Group, Environmental Defense Fund v. East Bay Municipal Utility District. Letter to unknown distribution list. October 11, 1993.
- Williams, J.G. 1993i. Video Monitoring the Upstream Migration of Adult Chinook Salmon with Video Equipment.
- Williams, J.G. 1992a. Agenda and letter addressing topics sent to the Review Panel. Fax transmittal to Sacramento County. October 29, 1992.
- Williams, J.G. 1992b. Brief Write-ups for Studies Considered for 1992-93.
- Williams, J.G. 1992c. Comments and Questions on the American River Temperature Models, 1990 Calibration Report. Letter to De Cuir & Somach. September 21, 1992.
- Williams, J.G. 1992d. Comments on American River Temperature Models, 1990 Calibration Report.
- Williams, J.G. 1992e. Comments on Specific Studies. Letter to F.I. Hodgkins, Sacramento County Department of Public Works. September 15, 1992.
- Williams, J.G. 1992f. Comments on Sacramento County's 1992-93 Studies.
- Williams, J.G. 1992g. Comments to Bill Snider, California Department of Fish and Game, on the Hydraulic Simulation of the Lower American River Report, dated, October '1992. November 20, 1992.

- Williams, J.G. 1992h. ~~Draft~~ letter Regarding Future American River Studies. Letter to East Bay Municipal Utility District. March 30, 1992.
- Williams, J.G. 1992i. Environmental Defense Fund v. East Bay Municipal Utility ~~District~~ Technical Group. Letter to unknown distribution list. February 26, 1992.
- Williams, J.G. 1992j. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter with attachments to unknown distribution list. October 1, 1992.
- Williams, J.G. 1992k. Environmental Defense' Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. June **14**, 1992
- Williams, **J.G.** 1992l. Environmental Defense Fund v. **East** Bay Municipal Utility District Technical Group. Letter to unknown distribution list. May 27, 1992
- Williams, J.G. 1992m. Figure from Colt and others, showing ~~that~~ levels ~~of~~ dissolved gas in the Lower American River were very high in 1983, Figure showing egg survival and water temperature v. date at Nimbus Dam, and Figure showing water temperature ~~from~~ April through June 1991.
- Williams, J.G. 1992n. Figures that illustrate concern with an empirical approach, they show that an empirical approach can take a long time.
- Williams, **J.G.** 1992o. Plots ~~of~~ Turbidity data from ~~the~~ Fairbairn Water Treatment Plant near H Street.
- williams, J.G. 1992p. Request for data **used** in Preparing Sacramento County Exhibit 899.
- Williams, J.G. 1992q. Response to Jon and Alan's comments on the ~~draft~~ letter regarding future American River studies.
- Williams. J.G. 1992r. Response to the September 3, 1992 letter and views about what should be done in 1993.
- Williams, J.G. 1992s. Turbidity Data Plots. Letter to Tom Payne and Associates, David Hankin, Department of Fisheries, Humboldt State University and Ted Kerstetter, Department of Biology, Humboldt State University. July 22, 1992.
- Williams, J.G. 1992t. Water Temperature in the lower American River. Letter to De Cuir & Somach. September 22, 1992.
- Williams, J.G. 1991a. Analysis for Rearing Habitat for Juvenile Chinook in the Lower American River for the California State Resources control Board, the California Department of Fish and Game.
- Williams, J.G. 1991**b** Comments on Draft Reports ~~from~~ Moyle, Vanicek, and Castlebeny.
- Williams, J.G. 1991c. Compilation ~~of~~ Graphs. September 23, 1991.
- Williams, J.G. 1991d. Environmental **Defense** Fund v. East Bay Municipal Utility District Technicai Group. Letter to unknown distribution list April 5, 1991.

- Williams, J.G. 1991e. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter with attachments to unknown distribution list. October 25, 1991.
- Williams, J.G. 1991f. Graphs of Chinook Salmon at various locations.
- Williams, J.G. 1991g. Letter to Tom Payne and Associates, David Hankin, Department of Fisheries, Humboldt State University and Ted Kerstetter, Department of Biology, Humboldt State University. December 23, 1991.
- Williams, J.G. 1991h. October 2, 1991 Meeting Recap. Letter to unknown parties. October 3, 1991.
- Williams, J.G. 1991i. Priorities for 1991-1992 Studies.
- Williams, J.G. 1991j. Scatter-gun Approach to answer the Question, "What is the Scientific Utility of the Data from the Community Surveys?"
- Williams, J.G. 1990a. Comments on the Draft Proposed Investigations of the Aquatic Resources in the Lower American River.
- Williams, J.G. 1990b. Comments on the in-river Production Index for Chinook Salmon.
- Williams, J.G. 1990c. Revised Introduction of Draft Conceptual Outline for Studies of the Aquatic Biology of the Lower American River. July 6, 1990.
- Williams, J.G. 1990d. Fish populations as part of the components and attributes of the natural ecosystem. Letter to Tenera Environmental Services. August 18, 1990.
- Williams, J.G. 1990e. Physical Solution Liaison Group, Environmental Defense Fund v. East Bay Municipal Utility District. Letter to unknown distribution list. February 27, 1990.
- Williams, J.G. 1990f. Aquatic Biology Technical Group, Environmental Defense Fund vs. East Bay Municipal Utility District. Letter to unknown distribution list. November 18, 1990.
- Williams, J.G. 1990f. Conceptual Outline for Studies of the Aquatic Biology of the Lower American River.
- Williamson, S.C., J.M. Bartholow and C.B. Stalnaker. 1993. Conceptual Model for Quantifying Pre-Smolt Production from Flow-Dependent Physical Habitat and Water Temperature. Regulated Rivers: Research & Management, 8:15-28.
- Wixom, L.H. 1981. Age and Spawning History of American Shad (*Alosa Sapidissima*) in Central California 1975-1978. Administrative Report No. 81-3. California Department of Fish and Game. Anadromous Fisheries Branch.
- Wixom, L.H. and D. Odenweller. 1991-1994. Annual Performance Reports for the Sacramento River Sport Fish Catch Inventory Project. Federal Aid in Sport Fish Restoration Act. California Department of Fish and Game
- Wixom, L.H., J. Piscotto, and C. Lake. 1995. Final report for the Sacramento River system sport fish catch. California Department of Fish and Game.

- Wolman, M.G. 1954. A method of sampling coarse river bed material. Transactions of the American Geophysical Union, 35(6):951-956.
- Wyland, J. 1993. Environmental Protection Agency Review of the Notice of Intent to Prepare an Environmental Impact Statement for the Project entitled Sacramento County Water Agency and San Juan Suburban Water District, Central Valley Project Water Service Contracts, United States Environmental Protection Agency.
- Yalin, M.S. 1977. Mechanics of Sediment Transport, 2nd edition. Pergamon Press, Oxford, United Kingdom.
- Yoshiyama, R.M., E.R. Gerstung, F.W. Fisher, P.B. Moyle. 1996. Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California. Sierra Nevada Ecosystem Project Final Report to Congress, Vol. III, Assessments, Commissioned Reports, and Background Information. Davis, University of California, Centers for Water and Wildland Resources.
- Young, M.K., W.A. Hubert, and T.A. Wesche. 1991a. Biases associated with four stream substrate samplers. Canadian Journal of Fisheries and Aquatic Sciences, 48:1882-1886.
- Young, M.K., W.A. Hubert, and T.A. Wesche. 1991b. Selection of measures of substrate composition to estimate survival to emergence of salmonids and to detect changes instream substrates. North American Journal of Fisheries Management, 11(3):339-346.
- Young, M.K., W.A. Hubert, and T.A. Wesche. 1990. Fines in redds of large salmonids. Transactions of the American Fisheries Society, 119:156-162.
- Zar, J.H. 1984. Biostatistical Analysis. Second Edition. Prentice-Hall, Incorporated., Englewood Cliffs, New Jersey.
- Zaugg, W.S. 1982. A simplified preparation for adenosine triphosphate determination in gill tissue. Canadian Journal of Fisheries and Aquatic Sciences, 39:215-217.
- Zaugg, W.S. and H.H. Wagner. 1973. Gill ATPase activity related to parr-smolt transformation and migration in steelhead trout (*Salmo gairdneri*): Influence of photoperiod and temperature. Comprehensive Biochemistry Physiology, 45(B) 955-965.
- Zaugg, W.S. and R.J. Knox. 1972. Changes in gill adenosine triphosphatase activity associated with parr-smolt transformation in steelhead trout, coho, and spring chinook salmon. Journal of the Fisheries Research Board of Canada, 29:167-171.
- Zaugg, W.S. n.d. Advanced photoperiod and water temperature effects of gill Na⁺-K⁺ Adenosine triphosphatase activity and migration of juvenile steelhead (*Salmo gairdneri*) Canadian Journal of Fisheries and Aquatic Sciences, 38:758-764.
- Zaugg, W.S., B.L. Adams, and L.R. McLain. 1972. Steelhead migration: potential temperature effects as indicated by gill adenosine triphosphatase activities. Science, 176:415-416.
- Zhang, B.N., F. Bouttes, and G. Dhatt. 1990. A shallow water finite element model for moving fronts. In G. Gambolati, A. Rinaldo, C.A. Brebbia, W.G. Gray, and G.F. Pinder; editors. Proceedings of the Eighth International Conference on Computational Methods in Water Resources. Venice, Italy.

Zienkiewicz, O.C. 1977. The Finite Element Method, 3rd edition. McGraw-Hill, London,

Zimmerman, M. 1999. Food Habits of Smallmouth Bass, Walleyes, and Northern Pikeminnow in the Lower Columbia River Basin during Outmigration of Juvenile Anadromous Salmonids. Transactions of the American Fisheries Society, 128:1036-1054.

- Williams, J.G. 1994g. Environmental Defense Fund v. East Bay Municipal Utility District Liaison Group. Letter to unknown distribution list. September 9, 1994.
- Williams, J.G. 1994h. Flow schedules. Letter to the California Department of Fish and Game, Region 2. October 19, 1994.
- Williams, J.G. 1993a. Additional thoughts on the relevance of the physiological studies to flow standards. Letter to unknown distribution list.
- Williams, J.G. 1993b. Comments on the Revised 1992/93 Lower American River Study Program.
- Williams, J.G. 1993c. Draft comments for the scoping of the Environmental Impact Statement on the Central Valley Project Improvement Act. Fax transmittal to Beak Consultants, Incorporated. April 4, 1993.
- Williams, J.G. 1993d. Draft Technical Sections, Special Master's Report for 1991 and 1992.
- Williams, J.G. 1993e. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. January 22, 1993.
- Williams, J.G. 1993f. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. February 22, 1993.
- Williams, J.G. 1993g. Feasibility of Video Monitoring of Adult Chinook Salmon Migration. Draft letter to Technical Advisory Committee for the Lower American River.
- Williams, J.G. 1993h. Liaison Group, Environmental Defense Fund v. East Bay Municipal Utility District. Letter to unknown distribution list. October 11, 1993.
- Williams, J.G. 1993i. Video Monitoring the Upstream Migration of Adult Chinook Salmon with Video Equipment.
- Williams, J.G. 1992a. Agenda and letter addressing topics sent to the Review Panel. Fax transmittal to Sacramento County. October 29, 1992.
- Williams, J.G. 1992b. Brief Write-ups for Studies Considered for 1992-93.
- Williams, J.G. 1992c. Comments and Questions on the American River Temperature Models, 1990 Calibration Report. Letter to De Cuir & Somach. September 21, 1992.
- Williams, J.G. 1992d. Comments on American River Temperature Models, 1990 Calibration Report.
- Williams, J.G. 1992e. Comments on Specific Studies. Letter to F.I. Hodgkins, Sacramento County Department of Public Works. September 15, 1992.
- Williams, J.G. 1992f. Comments on Sacramento County's 1992-93 Studies.
- Williams, J.G. 1992g. Comments to Bill Snider, California Department of Fish and Game, on the Hydraulic Simulation of the Lower American River Report, dated October 1992. November 20, 1992.

- Williams, J.G. 1992h. Draft letter Regarding Future American River Studies. Letter to East Bay Municipal Utility District. March 30, 1992.
- Williams, J.G. 1992i. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. February 26, 1992.
- Williams, J.G. 1992j. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter with attachments to unknown distribution list. October 1, 1992.
- Williams, J.G. 1992k. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. June 14, 1992.
- Williams, J.G. 1992l. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. May 27, 1992.
- Williams, J.G. 1992m. Figure from Colt and others, showing that levels of dissolved gas in the Lower American River were very high in 1983, Figure showing egg survival and water temperature v. date at Nimbus Dam, and Figure showing water temperature from April through June 1991.
- Williams, J.G. 1992n. Figures that illustrate concern with an empirical approach, they show that an empirical approach can take a long time.
- Williams, J.G. 1992o. Plots of Turbidity data from the Fairbairn Water Treatment Plant near H Street.
- Williams, J.G. 1992p. Request for data used in Preparing Sacramento County Exhibit 899.
- Williams, J.G. 1992q. Response to Jon and Alan's comments on the draft letter regarding future American River studies.
- Williams, J.G. 1992r. Response to the September 3, 1992 letter and views about what should be done in 1993.
- Williams, J.G. 1992s. Turbidity Data Plots. Letter to Tom Payne and Associates, David Hankin, Department of Fisheries, Humboldt State University and Ted Kerstetter, Department of Biology, Humboldt State University. July 22, 1992.
- Williams, J.G. 1992t. Water Temperature in the lower American River. Letter to De Cuir & Somach. September 22, 1992.
- Williams, J.G. 1991a. Analysis for Rearing Habitat for Juvenile Chinook in the Lower American River for the California State Resources control Board, the California Department of Fish and Game.
- Williams, J.G. 1991b. Comments on Draft Reports from Moyle, Vanicek, and Castlebeny.
- Williams, J.G. 1991c. Compilation of Graphs. September 23, 1991.
- Williams, J.G. 1991d. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter to unknown distribution list. April 5, 1991.

- Williams, J.G. 1991e. Environmental Defense Fund v. East Bay Municipal Utility District Technical Group. Letter with attachments to unknown distribution list. October 25, 1991.
- Williams, J.G. 1991f. Graphs of Chinook Salmon at various locations,
- Williams, J.G. 1991g. Letter to Tom Payne and Associates, David Hankin, Department of Fisheries, Humboldt State University and Ted Kerstetter, Department of Biology, Humboldt State University. December 23, 1991.
- Williams, J.G. 1991h. October 2, 1991 Meeting Recap. Letter to unknown parties. October 3, 1991.
- Williams, J.G. 1991i. Priorities for 1991-1992 Studies.
- Williams, J.G. 1991j. Scatter-gun Approach to answer the Question, "What is the Scientific Utility of the Data from the Community Surveys?"
- Williams, J.G. 1990a. Comments on the Draft Proposed Investigations of the Aquatic Resources in the Lower American River.
- Williams, J.G. 1990b. Comments on the in-river Production Index for Chinook Salmon.
- Williams, J.G. 1990c. Revised Introduction of Draft Conceptual Outline for Studies of the Aquatic Biology of the Lower American River. July 6, 1990.
- Williams, J.G. 1990d. Fish populations as part of the components and attributes of the natural ecosystem. Letter to Tenera Environmental Services. August 18, 1990.
- Williams, J.G. 1990e. Physical Solution Liaison Group, Environmental Defense Fund v. East Bay Municipal Utility District. Letter to unknown distribution list. February 27, 1990.
- Williams, J.G. 1990f. Aquatic Biology Technical Group, Environmental Defense Fund vs. East Bay Municipal Utility District. Letter to unknown distribution list. November 18, 1990.
- Williams, J.G. 1990f. Conceptual Outline for Studies of the Aquatic Biology of the Lower American River.
- Williamson, S.C., J.M. Bartholow and C.B. Stalnaker. 1993. Conceptual Model for Quantifying Pre-Smolt Production from Flow-Dependent Physical Habitat and Water Temperature. Regulated Rivers: Research & Management, 8:15-28.
- Wixom, L.H. 1981. Age and Spawning History of American Shad (*Alosa Sapidissima*) in Central California 1975-1978. Administrative Report No. 81-3. California Department of Fish and Game. Anadromous Fisheries Branch.
- Wixom, L.H. and D. Odenweller. 1991-1994. Annual Performance Reports for the Sacramento River Sport Fish Catch Inventory Project. Federal Aid in Sport Fish Restoration Act. California Department of Fish and Game
- Wixom, L.H., J. Piscotto, and C. Lake. 1995. Final report for the Sacramento River system sport fish catch. California Department of Fish and Game.

- Wolman, M.G. 1954. A method of sampling coarse river bed material. Transactions of the American Geophysical Union, 35(6):951-956.
- Wyland, J. 1993. Environmental Protection Agency Review of the Notice of Intent to Prepare an Environmental Impact Statement for the Project entitled Sacramento County Water Agency and San Juan Suburban Water District, Central Valley Project Water Service Contracts, United States Environmental Protection Agency.
- Yalin, M.S. 1977. Mechanics of Sediment Transport, 2nd edition. Pergamon Press, Oxford, United Kingdom.
- Yoshiyama, R.M., E.R. Gerstung, F.W. Fisher, P.B. Moyle. 1996. Historical and Present Distribution of Chinook Salmon in the Central Valley Drainage of California. Sierra Nevada Ecosystem Project Final Report to Congress, Vol. 111, Assessments, Commissioned Reports, and Background Information. Davis, University of California, Centers for Water and Wildland Resources.
- Young, M.K., W.A. Hubert, and T.A. Wesche. 1991a. Biases associated with four stream substrate samplers. Canadian Journal of Fisheries and Aquatic Sciences, 48:1882-1886.
- Young, M.K., W.A. Hubert, and T.A. Wesche. 1991b. Selection of measures of substrate composition to estimate survival to emergence of salmonids and to detect changes instream substrates. North American Journal of Fisheries Management, 11(3):339-346.
- Young, M.K., W.A. Hubert, and T.A. Wesche. 1990. Fines in redds of large salmonids. Transactions of the American Fisheries Society, 119:156-162.
- Zar, J.H. 1984. Biostatistical Analysis. Second Edition. Prentice-Hall, Incorporated., Englewood Cliffs, New Jersey.
- Zaugg, W.S. 1982. A simplified preparation for adenosine triphosphate determination in gill tissue. Canadian Journal of Fisheries and Aquatic Sciences, 39:215-217.
- Zaugg, W.S. and H.H. Wagner. 1973. Gill ATPase activity related to parr-smolt transformation and migration in steelhead trout (*Salmo gairdner*): Influence of photoperiod and temperature. Comprehensive Biochemistry Physiology, 45(B) 955-965.
- Zaugg, W.S. and R.J. Knox. 1972. Changes in gill adenosine triphosphatase activity associated with parr-smolt transformation in steelhead trout, coho, and spring chinook salmon. Journal of the Fisheries Research Board of Canada, 29:167-171
- Zaugg, W.S. n.d. Advanced photoperiod and water temperature effects of gill Na⁺-K⁺ Adenosine triphosphate activity and migration of juvenile steelhead (*Salmo gairdner*) Canadian Journal of Fisheries and Aquatic Sciences, 38:758-764
- Zaugg, W.S., B.L. Adams, and L.R. McLain. 1972. Steelhead migration: potential temperature effects as indicated by gill adenosine triphosphatase activities. Science, 176:415-416.
- Zhang, B.N., F. Bouttes, and G. Dhatt. 1990. A shallow water finite element model for moving fronts. In G. Gambolati, A. Rinaldo, C.A. Brebbia, W.G. Gray, and G.F. Pinder, editors. Proceedings of the Eighth International Conference on Computational Methods in Water Resources. Venice, Italy.

Zienkiewicz, O.C. 1977. The Finite Element Method, 3rd edition. McGraw-Hill, London.

Zimmerman, M. 1999. Food Habits of Smallmouth Bass, Walleyes, and Northern Pikeminnow in the Lower Columbia River Basin during Outmigration of Juvenile Anadromous Salmonids. Transactions of the American Fisheries Society, 128:1036-1054.

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LAR FISH GROUP**-- Charge --**

(Approved by the FISH Group 3/23/00)

The charge for the LAR Fisheries/In-Stream Habitat Group ("FISH Group," or "FG") is two-fold – (1) to involve all primary stakeholders in a collective effort, led by an independent third party and supported by a widely-respected technical consultant, to develop an initial fisheries and aquatic habitat management and restoration plan for the Lower American River; and (2) to provide strategic advice to proponents of LAR fisheries and aquatic habitat management and restoration projects who seek "early start" status for their projects. Further details on each of these assignments are provided below.

Initial Fisheries and Aquatic Habitat Management and Restoration Plan ("FISH Plan" hereafter). In developing the FISH Plan, the FISH Group will 'work with a technical consultant and a facilitator to:

1. Identify and prioritize opportunities for improving the health of the Lower American River, including both new initiatives and modifications to existing management practices;
2. Identify key data gaps limiting our ability to improve the health of the Lower American River, as well as research efforts needed to fill those gaps, and propose a research program to address these gaps; and
3. Develop a system for monitoring the health of the Lower American River on an ongoing basis, interpreting the resulting data to assess the effectiveness of FISH Plan interpretation, and adjusting management and restoration actions accordingly, in keeping with the principles of adaptive management.

The FISH Plan is referred to as "initial" in recognition that it will continue to be refined over the years, as additional data about the health of the LAR becomes available. The FISH Plan is intended to serve as the "aquatic habitat management element" of the Lower American River Task Force's River Corridor Management Plan (RCMP). Therefore, the FISH Group will coordinate with the Task Force and those working on other elements of the RCMP to ensure consistency. The FISH Plan is also intended to serve as the Habitat Management Plan for the Lower American River as required by the Water Forum Agreement, consistent with the mitigation described and certified in the Water Forum Agreement Environmental Impact Report and associated Mitigation, Monitoring, and Reporting Plan (MMRP).

In addition to the plan itself, the FISH Group will oversee the development of three additional, related work products – a baseline report, a bibliography covering literature about the health of LAR fisheries and aquatic habitat, and a "State-of-the-River" report. For further details, see Attachment A.

Early Start Projects. Much restoration work is already underway in the LAR. The FISH Group will build upon these efforts, and may be able to serve as a forum through which participating organizations can pursue objectives from other ongoing or planned state and federal initiatives that are consistent with the FISH Group's charge. Such initiatives may include:

- The American River component of CALFED's Ecological Restoration Program Plan (ERPP);

- The California Department of Fish and Games' Steelhead Restoration Plan for the American River;
- The federal Anadromous Fish Restoration Program (~~AFRP~~) of the Central Valley Project Improvement Act (CVPIA);
- SAFCA's Floodway Management Plan (FMP) for the LAR; and
- Sacramento County's American River Parkway Plan (ARPP).

However, each agency/organization represented on the FISH Group will retain autonomy over its own budget.

Another way in which the FISH Group may be able to support existing momentum to protect, enhance, and restore the Lower American River is through helping to launch projects that are suitable for early initiation. Based on stakeholder interviews, there appears to be widespread interest in the FISH Group using its auspices to support the initiation of compatible "early start projects" (or "ESPs") even while the FISH Group's focal planning process is underway. In this regard, the FISH Group ~~will~~ provide strategic input to project proponents (e.g., regarding the usefulness and design of their proposed projects). For those ESPs that enjoy overwhelming **support**, the FISH Group will consider providing a written endorsement to assist the project proponent in getting the project underway expeditiously.

Attachment A

LAR FISH GROUP

- Anticipated Work Products -

- A. **Baseline Report**. This report will include: (a) a concise description of the Lower American River and the primary physical processes that shape its current form; and (b) a *summary* of available data/information about the current health of the aquatic resources and habitat of the Lower American River. It will serve as a “baseline” against which to measure the effectiveness of any potential restoration efforts. The focus of this report will be akin to a doctor’s assessment of the health of a patient at a particular point in time. This document will be developed early in the planning process.
- B. **Bibliography for the LAR**. This document will provide a comprehensive list of relevant published and unpublished documents on the fisheries and aquatic habitat of the Lower American River. This information will be important in helping identify suitable potential restoration projects as part of the FISH Plan (discussed below).
- C. **An Initial Fisheries and Aquatic Habitat Management and Restoration Plan for the Lower American River (or “FISH Plan”)**. The FISH Plan is expected to:
1. Include an introductory section concisely describing the Lower American River and the primary physical processes that shape its current form;
 2. Identify appropriate restoration and management actions (e.g., projects and mitigation strategies);
 3. Articulate a plan for implementing these management, restoration, and research projects and mitigation strategies. The implementation plan should identify:
 - a. Project priorities;
 - b. The timeline in which the projects will be conducted;
 - c. Who will have the lead for each project;
 - d. A description of any technical assistance needed to develop, update, administer and implement the plan and monitor results, including type, amount, and cost of technical assistance (e.g., access to certain types of technical expertise, training, etc.); and
 - e. Cost-sharing and administrative arrangements needed to implement the plan in the field.
 4. Outline an ecological and biological monitoring plan for evaluating the effectiveness of any proposed restoration actions/mitigation strategies (including the techniques, indicators, and performance standards to be used);
 5. Identify data gaps and recommend a focused research program to improve understanding of the LAR ecosystem;

6. Recommend management practices that would enhance the effectiveness of LAR fisheries and aquatic habitat management and restoration efforts; and
 7. ~~Outline~~ a process for updating the FISH Plan based on adaptive management principles (e.g., adjustments to targets, funding priorities, and restoration techniques based on evaluation of preceding and ongoing efforts).
7. **D. State-of-the-River Report** This document will represent a version of the “Baseline Report” that has been edited and formatted to be user-friendly for the lay reader. While the Baseline Report is meant to characterize the existing condition of the LAR for use within the planning process, the **primary** purpose of the State-of-the-River Report is community education.
- E. Strategic Advice on Early Start Projects.** This advice may take the form of verbal input during FISH Group meetings, off-line discussions between FG members and project proponents, and project-specific written endorsements **on** behalf of the FG **as** a whole.

LAR FISH GROUP WORK PLAN/SCHEDULE

(Approved by FISH Group 3/23/00)

I. INTRODUCTION: The Lower American River Task Force, in cooperation with the Sacramento City-County Office of Metropolitan Water Planning and the Sacramento Area Flood Control Agency, has established the Fisheries/In-Stream Habitat (LAR FISH) Group as a venue in which to develop an initial fisheries and aquatic habitat management and restoration plan for the Lower American River (LAR). This plan is expected to be refined regularly over the ensuing years as additional data becomes available. The FISH Group will have facilitation support from the California Center for Public Dispute Resolution (CCPDR) and technical support from Surface Water Resources, Inc. (SWRI):

The Task Force anticipates that, once the FISH Group develops their initial fisheries and aquatic habitat management and restoration plan ("FISH Plan" hereafter), it will be endorsed by all FISH Group members on behalf of their organizations. The FISH Plan will then be submitted to the LAR Task Force for endorsement and incorporation into the River Comdor Management Plan (RCMP). Therefore, the FISH Group will coordinate with the Task Force and those working on other elements of the RCMP to ensure consistency.

This FISH Plan will also serve as the Habitat Management Plan for the Lower American River as required by the Water Forum Agreement, consistent with the mitigation described and certified in the Water Forum Agreement Environmental Impact Report and associated Mitigation, Monitoring, and Reporting Plan (MMRP). In addition, the Task Force anticipates that the FISH Plan will be submitted to additional relevant entities for their use in reviewing, modifying if necessary, and approving the components of the FISH Plan for which they are responsible. The actions and individual projects contemplated by the FISH Plan will be subject to further review and final approval by the responsible entities.

In addition to the FISH Plan itself, the LAR FISH Work Group will oversee the development of three additional, related work products - (1) a Baseline Report; (2) a Bibliography for the LAR; (3) and a State-of-the River Report. SWRI will have primary responsibility for drafting these four documents for the Work Group's consideration.

The FISH Group will also be asked to provide strategic advice on potential LAR fisheries and aquatic habitat management and restoration projects that may be suitable for early initiation ("Early Start Projects" or "ESPs" hereafter). Each of these five desired work products is described below.

- A. **Baseline Report.** This report will summarize available data/information about the current health of the aquatic resources and habitat of the Lower American River. It will serve as a "baseline" against which to measure the effectiveness of any potential restoration efforts. The focus of this report will be akin to a doctor's assessment of the health of a patient at a particular point in time. This document will be developed early in the planning process.

B. Bibliography for the LAR. This document will provide a comprehensive list of relevant published and unpublished documents on the fisheries and aquatic habitat of the Lower American River. This information will be important in helping identify suitable potential restoration projects as part of the FISH Plan (discussed below).

C. FISH Plan. The FISH Plan is expected to:

1. Include an introductory section concisely describing the Lower American River and the primary physical processes that shape its current form;
2. Identify appropriate restoration and management actions (e.g., projects and mitigation strategies);
3. Articulate a plan for implementing these management, restoration, and research projects and mitigation strategies. The implementation plan should identify:
 - a. Project priorities;
 - b. The timeline in which the projects will be conducted;
 - c. Who will have the lead for each project;
 - d. A description of any technical assistance needed to develop, update, administer and implement the plan and monitor results, including type, amount, and cost of technical assistance (e.g., access to certain types of technical expertise, training, etc.); and
 - e. Cost-sharing and administrative arrangements needed to implement the plan in the field.
4. Outline an ecological and biological monitoring plan for evaluating the effectiveness of any proposed restoration actions/mitigation strategies (including the techniques, indicators, and performance standards to be used) and interpreting the resulting data to assess the effectiveness of FISH Plan implementation;
5. Identify data gaps and recommend a focused research program to improve understanding of the LAR ecosystem;
6. Recommend management practices that would enhance the effectiveness of LAR fisheries and aquatic habitat management and restoration efforts; and
7. Outline a process for updating the FISH Plan based on adaptive management principles (e.g., adjustments to targets, funding priorities, and restoration techniques based on evaluation of preceding and ongoing efforts).

D. State-of-the-River Report. This document will represent a version of the “Baseline Report” that has been edited and formatted to be user-friendly for the lay reader. While the Baseline Report is meant to characterize the existing condition of the LAR for use within the planning process, the primary purpose of the State-of-the-River Report is community education.

- E. Strategic Advice on Early Start Projects. This advice may take the form of verbal input during FISH Group meetings, off-line discussions between FG members and project proponents, and project-specific written endorsements on behalf of the FG as a whole.

The work plan for producing these five work products over approximately one year follows. The work plan has been organized around the monthly FISH Group meetings, and reflects an integration of the facilitation and technical support being made available to the FISH Group as a result of funding from Water Forum participants and CALFED. The Sacramento Area Flood Control Agency (SAFCA), which convenes the LAR Task Force, is providing funding for facilitation of the LAR Task Force as a whole, and for other forms of technical support related to the development of the RCMP.

11. WORK PLAN FOR THE LAR FISH GROUP:

MEETING #1 March 1, 2000)¹

Focal Topics:

- Draft charge and vision statement (working from an initial charge document, which will also identify anticipated deliverables, and a strawman vision statement; stimulated by a slideshow).
- Initial identification of interests and constraints (FG member comments).
- Draft work plan schedule and consensus-building guidelines. (Ask participants to review these within a week (by 3/8), as facilitation team will be calling to elicit any related issues that will need discussion at Meeting #2.)

Meeting Preparation:

- **Procedural Meeting Materials Needed (CCPDR Lead):** Letter of invitation, draft agenda with cover memo, FG membership list, initial charge statement, draft vision statement, draft work plan, draft schedule, and draft consensus-building guidelines.
- **Technical Meeting Materials Needed (SWRI Lead):** None currently anticipated for discussion at this meeting.
- **Other Meeting Materials Needed:** LAR slideshow, to be prepared and conducted by Randy Smith.
- **Other Procedural Support Needed (CCPDR Lead):** Stakeholder consultations (e.g., related to framing of project).
- **Other Technical Support Needed (SWRI Lead):** Begin development of draft outlines for Baseline Report, FISH Plan, and Bibliography.

¹ For each meeting we will need meeting facility, two flip chart stands/pads, felt markers, masking tape, overhead projector and screen, refreshments, name tags, and tent cards for all meeting participants (to be arranged by the Water Forum in consultation with SAFCA and facilitator).

Follow-Up Steps:

- **Meeting Summary (Water Forum Lead)**. Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- **Procedural Support (CCPDR Lead)**:
 - Call FG members to elicit any concerns about draft vision, charge, work plan/schedule and draft consensus-building guidelines.
 - Revise draft vision statement, charge, draft work plan/schedule and draft consensus-building guidelines to incorporate FG comments.
- **Technical Support (SWRI Lead)**. Document relevant FG comments for incorporation into technical documents on an ongoing basis.
- **LAR Task Force**: 5-minute update to LAR TF at its 3/14/00 meeting.
- **Outreach Efforts (Water Forum Lead)**.
 - Briefings as needed.

MEETING #2 (March 23, 2000):

Focal Topics:

- Reach closure on draft vision, charge, work plan/schedule (including use of a technical subcommittee) and draft consensus-building guidelines.
- Initiate discussion of goals (working from strawman draft reflecting synthesis of convening input & SWRI expertise).
- Decide on informational presentations to be provided to FG (working from a strawman informational program based on suggestions in convening interviews)

Meeting Preparation:

- **Procedural Meeting Materials Needed (CCPDR lead)**:
 - Revised drafts of charge, consensus-building guidelines, vision statement, and draft work plan/schedule
 - Initial drafts of agenda with cover memo, and list of informational presentations (developed in consultation with SWRI and project manager)
 - Information about the LAR Task Force, its other work groups, and the River Corridor Management Plan (RCMP)
- **Technical Meeting Materials Needed (SWRI Lead)**:
 - Draft list of preliminary goals
 - Draft bibliography
- **Other Meeting Materials Needed**: None. **Other Procedural Support Needed (CCPDR Lead)**: Consultations related to possible Early Start Projects (ESPs).
- **Other Technical Support Needed (SWRI Lead)**: Continue development of draft outlines for Baseline Report, FISH Plan, and Bibliography.

Follow-Up Steps:

- **Meeting Summary Water Forum Lead**). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- **Procedural Support (CCPDR Lead)**:
 - Revise/disseminate approved work plan/schedule and consensus-building guidelines, incorporating FG comments.
 - Revise draft goals and informational program to incorporate FG comments.
 - Arrange for informational programs.
 - Stakeholder consultations as needed.
 - Develop draft membership slate for technical subcommittee.
- **Technical Support (SWRI Lead)**. Assist in developing draft technical subcommittee slate.
- **LAR Task Force**: 5-minute update to LAR TF at its 4/1 1/00 meeting.
- **Outreach**: None anticipated.

MEETING #3 (April 27, 2000):

Focal Tonics:

- Closure on preliminary goals
- Decide on initial composition of technical subcommittee.
- Draft outline of FISH Plan
- Draft outline of Baseline Report (with footnote re: connection to State-of-the-River Report)
- Draft outline of Bibliography
- Circulate summary descriptions of proposed ESPs. (Ask FG members to discuss with their constituents to ascertain degree of support and/or controversy.)

Meeting Preparation:

- **Procedural Meeting Materials Needed (CCPDR Lead)**:
 - Revised draft goals
 - Initial draft of agenda with cover memo
- **Technical Meeting Materials Needed (SWRI Lead)**: Initial drafts of outlines for FISH Plan, Baseline Report, and Bibliography
- **Other Meeting Materials Needed**: Summary descriptions of proposed ESPs, to be provided by project proponents (e.g., one page describing project and one page describing what's been done to bring it to fruition to date).
- **Other Procedural Support Needed (CCPDR Lead)**: Stakeholder consultations related to possible ESPs.
- **Other Technical Support Needed (SWRI Lead)**: To be determined.

Follow-UDSteps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead):
 - Revise/disseminate approved goals, incorporating FG comments.
 - Stakeholder consultations as needed.
- Technical Support (SWRI Lead). Revise three draft outlines to incorporate FG comments.
- LAR Task Force: Share approved preliminary goals at 5/9 meeting. Comments welcome on-site or through a FG member.
- Outreach Efforts (Water Forum Lead). Briefings as needed.

MEETING #4 (May 18.2000):

Focal Topics:

- Informational presentations (e.g., species' needs; relevant LAR operations)
- Closure on revised outlines of FISH Plan, Baseline Report, and Bibliography
- Circulate summary descriptions of any proposed ESPs.²
- Consider endorsement of any queued-up ESPs
- Group self-assessment to ascertain we are on track/adjust if necessary.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDR Lead): Initial draft of agenda with cover memo
- Technical Meeting Materials Needed (SWRI Lead):
 - Revised drafts of outlines for FISH Plan, Baseline Report, and Bibliography
 - May need to develop some informational presentations
- Other Meeting Materials Needed: Informational presentations (leads on preparation to be determined)
- Other Procedural Support Needed (CCPDR Lead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead): Stakeholder consultations as needed.
- Technical Support (SWRI Lead): Revise/disseminate approved outlines for FISH Plan, Baseline Report, and Bibliography, incorporating FG comments.

² It is possible that ESPs may be proposed at any point in the life of the FISH Group.

- LAB Task Force: Share outlines of FISH Plan, Baseline Report, and Bibliography at 6/13 meeting.
- Outreach Efforts (Water Forum Lead).
 - Progress report to interested parties regarding availability of approved preliminary goals and outlines for FISH Plan, Baseline Report, and Bibliography. Progress report may take the form of a memo and/or article for inclusion in others' newsletters or on their websites. Provide point of contact for further information or comments.
 - Briefings as needed.

MEETING #5 (June 14, 2000):

Focal Topics:

- Consider draft Baseline **Report/limiting** factors presentation. Discussion of what "needs fixing." Consider implications for preliminary goals and possibility of selecting a few on which to focus.
- Consider draft outline of monitoring and adaptive management plans.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDR Lead): Initial draft of agenda with cover memo
- Technical Meeting Materials Needed (SWRI Lead):
 - Initial draft of Baseline Report with accompanying presentation, which will include overview of report's contents and implications regarding LAR limiting factors for LAR aquatic resources;
 - Initial draft outline of monitoring and adaptive management plans.
- Other Meeting Materials Needed: To be determined.
- Other Procedural Support Needed (CCPDR Lead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-UDStem:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead): Stakeholder consultations as needed.
- Technical Support (SWRI Lead). Revise outline of monitoring and adaptive management plans and draft Baseline Report, incorporating FG comments.
- LAR Task Force: To be determined.
- Outreach Efforts (Water Forum Lead). Briefings as needed.

MEETING.#6 (July 13,2000):

Focal Topics:

- Initial discussion of preliminary objectives.
- Closure on monitoring and adaptive management plan outlines.

Meeting PreDaration:

- *Procedural Meeting Materials Needed (CCPDRLead)*: Initial draft of agenda with cover memo
- *Technical Meeting Materials Needed (SWRI Lead)*: Initial draft of preliminary, objectives (to be developed in consultation with facilitator and project manager)
- *Other Meeting Materials Needed*: To be determined.
- *Other Procedural Support Needed (CCPDRLead)*: To be determined.
- *Other Technical Support Needed (SWRILead)*: To be determined.

Follow-Up Steps:

- *Meeting Summary /Water Forum Lead*). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- *Procedural Support (CCPDRLead)*: Stakeholder consultations as needed.
- *Technical Support (SWRI Lead)*.
 - Revise/disseminate approved monitoring and adaptive management plans, incorporating FG comments.
 - Revise draft preliminary objectives to incorporate FG comments.
- *LAR Task Force*: Share approved monitoring adaptive management plan outlines at 8/8/00 TF meeting. Comments welcome on-site or through a FG member.
- *Outreach Efforts /Water Forum Lead*). To be determined.

MEETING #7 (August 17,2000):

Focal Topics:

- Closure on preliminary objectives.
- Closure on revised draft Baseline Report.
- **Initial** discussion of project selection criteria and approach (variables to include in project descriptions and level of analysis expected)

Meeting Preparation:

- *Procedural Meeting Materials Needed (CCPDRLead)*: Initial draft of agenda with cover memo, project selection criteria and approach (to be developed in consultation with SWRI and project manager).
- *Technical Meeting Materials Needed (SWRILead)*: Revised drafts of objectives and Baseline Report
- *Other Meeting Materials Needed*: To be determined.

- Other Procedural Support Needed (CCPDRLead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDRLead):
 - Revise draft project selection criteria and approach, incorporating FG comments.
 - Stakeholder consultations as needed.
- Technical Support (SWRI Lead). Revise/disseminate approved draft objectives and Baseline Report, incorporating FG comments.
- LAR Task Force: Share approved Baseline Report and preliminary objectives at 9/12 TF meeting.
- Outreach Efforts (Water Forum Lead).
 - progress report to interested parties, notifying them of availability of approved Baseline Report and preliminary objectives. Progress report may take the form of a memo and/or article for inclusion in others' newsletters or on their websites. Provide point of contact for further information or comments.
 - Briefings as needed.

MEETING #8 (September 21, 2000):

Focal Tonics:

- Closure on project selection criteria and approach.
- Consider/modify/approve draft outline of SOR Report.
- Consider strawman project list.
- Group self-assessment to ascertain we are on track/adjust if necessary.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDRLead):
 - Revised drafts of project selection criteria, and project selection approach
 - Initial draft of agenda with cover memo
- Technical Meeting Materials Needed (SWRI Lead):
 - Initial draft list of projects for consideration and outline of SOR Report
 - Revised draft preliminary objectives
- Other Meeting Materials Needed: To be determined.
- Other Procedural Support Needed (CCPDRLead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead):
 - Revise/disseminate approved project selection criteria and approach, incorporating FG comments.
 - Stakeholder consultations as needed.
- Technical Support (SWRI Lead).
 - Revise/disseminate approved SOR Report outline, incorporating FG comments.
 - Revise draft list of candidate projects to incorporate FG comments.
- LAR Task Force: Share approved project selection criteria and approach, and draft list of projects for consideration at 10/10 TF meeting.
- Outreach Efforts (Water Forum Lead).
 - Progress report to interested parties, notifying them of availability of approved project selection criteria and approach, and opportunity to review and comment on revised draft list of projects for consideration (the version that has incorporated FG's initial revisions). Progress report may take the form of a memo and/or article for inclusion in others' newsletters or on *their* websites. Provide point of contact for further information or comments.
 - Press release re: availability of draft list of projects to be considered and project selection criteria, with contact information for anyone with additional projects to suggest for consideration.
 - Briefings as needed.

MEETING #9 (October 19, 2000):

Focal Topics:

- Discuss draft Bibliography, and associated draft sections of FISH Plan discussing implications for needed types of management/storation projects, data gaps/research needs, and recommended modifications to management practices.
- Refine preliminary goals and objectives accordingly.
- Add to project list/project idea development.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDR Lead): Initial draft of agenda with cover memo
- Technical Meeting Materials Needed (SWRI Lead):
 - Revised list of candidate projects
 - Initial draft of Bibliography, and associated draft sections of FISH Plan discussing implications for needed types of management/storation projects, data gaps/research needs, and recommended modifications to management practices.
- Other Meeting Materials Needed: To be determined.

- Other Procedural Support Needed (CCPDR Lead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead): Stakeholder consultations **as** needed.
- Technical Support (SWRI Lead).
 - Revise list of candidate projects, Bibliography, and associated draft sections of FISH Plan discussing implications for needed types of management the storage projects, data gaps/research needs, and recommended modifications to management practices, to incorporate FG comments.
 - Conduct initial analysis of candidate projects per methods agreed upon by FG.
- LAR Task Force: Share revised project list at 11/14/00 TF meeting.
- Outreach Efforts (Water Forum Lead). Briefings **as** needed.

MEETING #10 (November 16, 2000):

Focal Topics:

- Consider draft SOR report.
- Review project analysis.
- Initial project selection.
- Identify technical assistance/information needed to advance project selection.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDR Lead): Initial draft of agenda with cover memo
- Technical Meeting Materials Needed (SWRI Lead):
 - Revised list of candidate projects
 - Initial draft of SOR Report and project analysis
- Other Meeting Materials Needed: To be determined.
- Other Procedural Support Needed (CCPDR Lead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment **as** needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead): Stakeholder consultations **as** needed.

- Technical Support (SWRI Lead).
 - Revise draft SOR report, draft project list and possibly project analysis to incorporate FG comments.
 - Obtain additional information/complete project analysis.
- LAR Task Force: 5 minute update at 12/12 TF meeting.
- Outreach Efforts (Water Forum Lead). To be determined.

MEETING #11 (December 19, 2000):

Focal Topics:

- Review/approve revised Bibliography, and associated draft sections of FISH Plan discussing implications for needed types of management/restoration projects, data gaps/research needs, and recommended modifications to management practices.
- Review additional data.
- Refine project selection.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDR Lead): Initial draft of agenda with cover memo
- Technical Meeting Materials Needed (SWRI Lead):
 - Compilation of project-related data requested by FG
 - Revised list of candidate projects and project analysis
 - Revised Bibliography, and associated draft sections of FISH Plan discussing implications for needed types of management/restoration projects, data gaps/research needs, and recommended modifications to management practices.
- Other Meeting Materials Needed: To be determined.
- Other Procedural Support Needed (CCPDR Lead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-UTI Steps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead): Stakeholder consultations as needed.
- Technical Support (SWRI Lead).
 - Revise draft project list to incorporate FG comments.
 - Obtain additional information/complete project analysis.
 - Revise/disseminate approved Bibliography, incorporating FG comments.
- LAR Task Force: Share approved Bibliography and associated draft sections of FISH Plan discussing implications for needed types of management/restoration projects, data gaps/research needs, and recommended modifications to management practices with LAR Task Force at 1/9/01 Task Force meeting.
- Outreach Efforts (Water Forum Lead). To be determined.

MEETING #12 (January 18, 2001):

Focal Topics:

- Closure on project selection.
- Review draft monitoring and adaptive management plans.
- Discuss components of implementation plan (e.g., project prioritization and sequencing)
- Consider/approve revised SOR Report and provide packaging input.
- Group self-assessment to ascertain we are on track/adjust if necessary.

Meeting PreDaration:

- Procedural Meeting Materials Needed (CCPDR Lead): Initial draft of agenda with cover memo
- Technical Meeting Materials Needed (SWRI Lead):
 - Revised drafts of SOR Report, project candidate list, and project analyses
 - Initial drafts of monitoring and adaptive management plans and list of packaging/formatting questions for FG regarding SOR Report.
- Other Meeting Materials Needed: To be determined.
- Other Procedural Support Needed (CCPDR Lead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meetinn Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead): Stakeholder consultations as needed.
- Technical Support (SWRI Lead).
 - Revise/disseminate approved list of candidate projects, incorporating FG comments. (SOR Report then goes into production to be available to public in bound form in April, 2000.)
 - Develop initial draft of implementation plan, reflecting WG discussion at this meeting.
 - Revise draft monitoring and adaptive management plans and draft SOR report to incorporate FG comments.
 - Synthesize previously agreed-upon pieces of FISH Plan into single document/disseminate to FG for review.
- LAR Task Force: Share approved project slate and SOR Report at 2/13 TF meeting.
- Outreach Efforts (Water Forum Lead).
 - Press release re: availability of SOR Report and forthcoming FISH Plan.

- Progress report to interested parties, notifying them of availability of approved project slate, Bibliography, and associated draft sections of FISH Plan discussing implications for needed types of management/restoration projects, data gaps/research needs, and recommended modifications to management practices. Progress report may take the form of a memo and/or article for inclusion in others' newsletters or on their websites. Provide point of contact for further information or comments.
- Briefings as needed.

MEETING #13 (February 15, 2001):

Focal Topics:

- Discuss draft FISH Plan, including revised monitoring and adaptive management plans and draft implementation plan.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDRLead): Initial draft of agenda with cover memo
- Technical Meeting Materials Needed (SWRILead):
 - Revised drafts of monitoring and adaptive management plans
 - Initial draft of FISH Plan, including section focusing on implementation
- Other Meeting Materials Needed: To be determined.
- Other Procedural Support Needed (CCPDRLead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDRLead): Stakeholder consultations on issues related to draft FISH Plan.
- Technical Support (SWRILead). Revise draft FISH Plan to incorporate FG comments.
- Extra Review (Water Forum Lead). Disseminate revised FISH Plan to FG members to approve revisions before draft FISH Plan is disseminated more widely for review and comment.
- LAR Task Force: Share revised FISH Plan/ elicit feedback at 3/13 **TF** meeting.
- Outreach Efforts (Water Forum Lead).
 - Press release and progress report to interested parties notifying them of the availability of draft FISH Plan for review and comment. Provide point of contact for further information or comments.
 - Provide extra copies of revised FISH Plan to FG members for purposes of final constituent review.
 - Briefings as needed.

MEETING #14 (March 15, 2001):

Focal Topics:

- Refine revised FISH Plan to reflect constituent and LAR TF feedback.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDR Lead): Initial draft of agenda with cover memo and summary of reviewers' issues related to the FISH Plan which require FG discussion.
- Technical Meeting Materials Needed (SWRI Lead): Revised draft FISH Plan
- Other Meeting Materials Needed: To be determined.
- Other Procedural Support Needed (CCPDR Lead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meeting Summary (Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead): Stakeholder consultations as needed.
- Technical Support (SWRI Lead). Fine-tune draft FISH Plan to incorporate FG comments.
- Extra Review (Water Forum Lead). Disseminate revised FISH Plan to FG members to approve revisions before draft FISH Plan is disseminated more widely.
- LAR Task Force: Share revised draft FISH Plan/ elicit feedback at 4/10 meeting:
- Outreach Efforts Water Forum Lead.
 - Disseminate revised draft FISH Plan to interested parties for two week review and comment period.
 - Briefings as needed.

MEETING #15 (April 19, 2001):

Focal Topics:

- Discuss LAR Task Force and public feedback, and potential revisions needed.
- Plan FG endorsement ceremony/celebration.
- Group self-assessment – identification of lessons learned.
- Submit FISH Plan to LAR TF for endorsement.

Meeting Preparation:

- Procedural Meeting Materials Needed (CCPDR Lead):
 - Initial draft of agenda with cover memo
 - Summary of LAR Task Force and public feedback, and issues needing further FG discussion

- Technical Meeting Materials Needed (SWRI Lead): Revised draft FISH Plan
- Other Meeting Materials Needed: List of questions for FG regarding desired arrangements for celebration (Water Forum Lead).
- Other Procedural Support Needed (CCPDR Lead): To be determined.
- Other Technical Support Needed (SWRI Lead): To be determined.

Follow-Up Steps:

- Meeting Summary Water Forum Lead). Editing opportunity for facilitator; SWRI may be asked to review and comment as needed). E-mail to FG members. If FG members request corrections during the subsequent week, revise as needed and email final to FG members.
- Procedural Support (CCPDR Lead): Stakeholder consultations as needed.
- Technical Support (SWRI Lead). Revise/disseminate FISH Plan, incorporating agreed-upon changes for final approval by FG
- LAR Task Force: Request TF endorsement at 5/8 TF meeting.
- Outreach Efforts Water Forum Lead).
 - Press release re: completion of FISH Plan, how to get copies, and next steps.
 - Briefings as needed.

III. CONCLUSION: This draft work plan represents an initial strategy for collaboratively producing the FISH Group's five work products. Due to the fluid nature of a consensus-building process, this work plan may well be modified in numerous ways as the process unfolds in response to the FISH Group's needs as well as funding and time constraints. Any significant changes will be made in consultation with FISH Group members.

**DEVELOPMENT OF A FISHERIES AND AQUATIC HABITAT
MANAGEMENT AND RESTORATION PLAN
FOR THE LOWER AMERICAN RIVER**

-- Consensus-Building:Guidelines --
(Approved by FISH Group 3/23/00)

For any consensus-building process to go smoothly, it is helpful for those involved to agree at the outset on the purpose of the process and on the procedures by which the group will govern its deliberations and decision making.

PURPOSE AND ANTICIPATED WORK PRODUCTS OF THE CONSENSUS-BUILDING PROCESS

The purpose of ~~this~~ consensus-building process is two-fold – (1) to involve all primary stakeholders in a collective effort, led by an independent third party and supported by a widely-respected technical consultant, to develop an initial fisheries and aquatic habitat management and restoration plan for the Lower American River; and (2) to provide strategic advice to proponents of LAR fisheries and aquatic habitat management and restoration projects who seek “early start” status for their projects. Work products include a baseline report summarizing current data on the health of the river, a bibliography on the fisheries and aquatic habitat of the LAR, the initial plan, and the first annual State-of-the-River Report. Further details on each of these assignments are provided in the “Charge” document.

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Technical Subcommittee. The FISH Group will establish a small technical subcommittee to assist the technical consultant on an as-needed basis in translating FISH Group guidance into *draft* deliverables for review by the full FISH Group. The Technical Subcommittee will be small, but can be augmented on an issue-specific basis with individuals bringing critical expertise not otherwise available on the Subcommittee. Members of the Technical Subcommittee need not be members of ~~the~~ FISH Group.

Interested Parties/Related Initiatives. While all **FISH** Group members are expected to keep their respective constituencies apprised of progress and to bring their constituents’ views into FISH Group discussions, there will be a periodic need for more in-depth consultations with several ongoing initiatives to ensure that the resulting plan and projects have broad-based support. These initiatives include:

1. The LAR Task Force and its Bank Protection and Floodway Management Work Groups (which anticipate using this plan **as** the aquatic habitat element of the over-all Lower American River Corridor Management Plan, or "RCMP");
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Staff anticipate providing briefings at strategic points on an as-needed basis to other interested parties as well, including elected officials, the Environmental Council of Sacramento, civic association, and the Sacramento River Watershed Program.

Staff will also provide periodic *summary* progress reports to interested parties in the form of a memo, newsletter, or article for inclusion in others' newsletters and websites. Newsletters that might be effective vehicles for such outreach include the California Flyfishers Unlimited's newsletter, "On'theFly" and River City Paddlers' newsletter, "River City Reflections." At a minimum, such updates will be posted on the website of the Sacramento City-County Office of Metropolitan Planning. There are likely to be **2-4** such progress reports over the next **year** to apprise interested parties of milestones such **as** project launch, completion of **draft** goals **and** objectives, completion of list of projects to be considered, availability of State-of-the-River Report, availability of the review **draft** of the initial fisheries and aquatic habitat management and restoration plan, and availability of the **final** version of the initial plan.

Additional ways in which FISH Group members can **make** effective linkages with related initiatives include: (a) the FISH Group's own members, many of whom are involved in related initiatives; (b) guest speakers; (c) field trips; and (d) inclusion of related reports in the bibliography to be provided by the technical consultant.

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The FISH Group generally will meet on the third Thursday of each month from 1:00-4:30 p.m. There may be an occasional exception to this pattern – e.g., to avoid holidays and the occurrence of FISH Group meetings the same week as meetings of the Lower American River Task Force (the FISH Group’s parent body). It may be necessary to meet for a full day for particular topics; this will be decided by the FISH Group on a case-by-case basis. A list of proposed meeting dates is available under separate cover.

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It is anticipated that FISH Group members may want to review raw data along with the consultants’ analyses, and to sometimes ask colleagues in their respective organizations to review the consultant’s work products **as** well in a form of peer review.

The facilitator will assist SWRI in translating the FISH Group’s guidance onto paper. **The** Sacramento City-County Office of Metropolitan Planning, which manages the relevant

funds generated by the Water Forum Agreement as well as the CALFED grant, has a fiduciary responsibility to oversee the work of the facilitator and technical consultant on this project,

DECISION MAKING

The FISH Group will make decisions by consensus. Consensus will mean that all FISH Group members either fully support or can live with the decision (or over-all plan), and believe that their constituents can as well. Consensus does not mean one hundred percent agreement on every issue, but rather support for moving forward with a recommendation taken as a whole. "Straw polls" may be taken on occasion to get a general impression of FISH group members' attitudes about particular topics. Disagreements will be regarded as problems to be solved rather than as battles to be won.

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Agreement. The FISH Group's final agreement on the plan is expected to take the form of a written statement, signed by FISH Group members after they are appropriately authorized by the parties they represent, and included as the foreword to the plan.

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The Lower American River Task Force envisions that, once the FISH Group is satisfied with the initial plan, it will be endorsed by all FISH Group members on behalf of their organizations. It will then be submitted to the LAR Task Force for endorsement and incorporation into the over-all River Corridor Management Plan, which the Task Force has recently decided to develop.

The plan developed by the FISH Group will also serve as the Habitat Management Program for the Lower American River as required by the Water Forum Agreement, consistent

with the mitigation described and certified in the Water Forum Agreement Environmental Impact Report and associated Mitigation, Monitoring, and Reporting Plan (MMRP).

Both the Water Forum and SAFCA have indicated that they welcome other organizations with related objectives joining with them to ensure that this plan advances others' compatible objectives as well. The Task Force anticipates that the plan will be submitted to other organizations for their use in reviewing, modifying if necessary, and approving the components of the plan for which they are responsible. (For example, the plan may be suitable for incorporation into the next update of the American River Parkway Plan.) The actions and individual projects contemplated by the plan will be subject to further review and final approval by the responsible entities. Each participating organization retains decision-making autonomy.

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During stakeholder interviews, many interviewees expressed both appreciation for the idea of developing a comprehensive plan based on sound science and concern about spending too much time studying the issues prior to undertaking any restoration projects. Consequently, this planning effort will be available as a "launching pad" for LAR fisheries and/or aquatic habitat management and restoration projects that enjoy overwhelming, broad-based support. FISH Group members will be asked to spend a small portion of selected meetings considering whether to provide a letter of endorsement for selected projects of this kind.

A project proponent who believes his/her project may be appropriate for endorsement by the FISH Group as an "early start project" (ESP) should contact the facilitator to discuss the best way to communicate with the FISH Group about it. If the project ~~as~~ initially presented to the FISH Group is controversial, the proponent can proceed with ~~the~~ project without the FISH Group's endorsement or ~~ask~~ that the project be considered in the normal course of the planning process. Alternatively, if interest is ~~high~~ and time and resources allow, the FISH Group may ask the facilitator to assist interested parties in resolving the associated controversy and then the proponent may re-present his or her proposal to the FISH Group.

SAFEGUARDS

Good Faith. All parties agree to act in good faith ~~in all~~ aspects of this consensus-building process, and to communicate their interests in FISH Group meetings. Offers made in frank conversations about creative solutions will not be used against any ~~party~~ in future litigation or public relations. This provision will not restrict the ability of FISH Group members to speak to the press or pursue legal strategies in the future. Personal attacks and stereotyping will not be acceptable. FISH Group members will refrain from impugning the motivations and intentions of others.

Good faith also requires that parties not make commitments they do not intend to follow through with, and that parties act consistently in the FISH Group and in other forums where the issues under discussion in the FISH Group are also being discussed, including contacts with the press. Good faith also requires that members make a concerted effort to provide information requested by other members, or explain why not.

Withdrawal. Any member may withdraw from the FISH Group at any time. Communication about the reasons for withdrawing would be helpful.

If two or more FISH Group meetings go by without representation ~~from~~ either a primary representative or his/her alternate, that organization will be asked to appoint another representative. An organization also can be asked to appoint another representative if the current representative participates in a way that is inconsistent with the purpose, charge, meeting procedures, or consensus-building guidelines.

Good faith provisions continue to apply to those who withdraw or may be asked to step down.

Press. FISH Group members recognize that the way in which positions are publicly stated may affect the ability of the FISH Group to reach consensus. Therefore, whenever possible, they ~~will~~ refer inquiries from the press regarding the overall progress of the process to the project manager (~~Susan~~Davidson) or the facilitator (Marci DuPraw). They agree not to characterize the positions and views of any other party in public forums or press contacts, **and** not to attribute comments to other members.

**DEVELOPMENT OF A FISHERIES AND AQUATIC HABITAT
MANAGEMENT AND RESTORATION PLAN
FOR THE LOWER AMERICAN RIVER**

-- Consensus-Building Guidelines --
(Approved by FISH Group 3/23/00)

For any consensus-building process to go smoothly, it is helpful for those involved to agree at the outset on the purpose of the process and on the procedures by which the group will govern its deliberations and decision making.

PURPOSE AND ANTICIPATED WORK PRODUCTS OF THE CONSENSUS-BUILDING PROCESS

The purpose of this consensus-building process is two-fold – (1) to involve all primary stakeholders in a collective effort, led by an independent third party and supported by a widely-respected technical consultant, to develop an initial fisheries and aquatic habitat management and restoration plan for the Lower American River; and (2) to provide strategic advice to proponents of LAR fisheries and aquatic habitat management and restoration projects who seek “early start” status for their projects. Work products include a baseline report summarizing current data on the health of the river, a bibliography on the fisheries and aquatic habitat of the LAR, the initial plan, and the first annual State-of-the-River Report. Further details on each of these assignments are provided in the “Charge” document.

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EARLY START PROJECTS

During stakeholder interviews, many interviewees expressed both appreciation for the idea of developing a comprehensive plan based on sound science and concern about spending too much time studying the issues prior to undertaking any restoration projects. Consequently, this planning effort will be available as a "launching pad" for LAR fisheries and/or aquatic habitat management and restoration projects that enjoy overwhelming, broad-based support. FISH Group members will be asked to spend a small portion of selected meetings considering whether to provide a letter of endorsement for selected projects of this kind.

A project proponent who believes his/her project may be appropriate for endorsement by the FISH Group as an "early start project" (ESP) should contact the facilitator to discuss the best way to communicate with the FISH Group about it. If the project as initially presented to the FISH Group is controversial, the proponent can proceed with the project without the FISH Group's endorsement or ask that the project be considered in the normal course of the planning process. Alternatively, if interest is high and time and resources allow, the FISH Group may ask the facilitator to assist interested parties in resolving the associated controversy and then the proponent may re-present his or her proposal to the FISH Group.

SAFEGUARDS

Good Faith. All parties agree to act in good faith in all aspects of this consensus-building process, and to communicate their interests in FISH Group meetings. Offers made in frank conversations about creative solutions will not be used against any party in future litigation or public relations. This provision will not restrict the ability of FISH Group members to speak to the press or pursue legal strategies in the future. Personal attacks and stereotyping will not be acceptable. FISH Group members will refrain from impugning the motivations and intentions of others.

Good faith also requires that parties not make commitments they do not intend to follow through with, and that parties act consistently in the FISH Group and in other forums where the issues under discussion in the FISH Group are also being discussed, including contacts with the press. Good faith also requires that members make a concerted effort to provide information requested by other members, or explain why not.

Withdrawal. Any member may withdraw from the FISH Group at any time. Communication about the reasons for withdrawing would be helpful.

If two or more FISH Group meetings go by without representation from either a primary representative or his/her alternate, that organization will be asked to appoint another representative. An organization also can be asked to appoint another representative if the current representative participates in a way that is inconsistent with the purpose, charge, meeting procedures, or consensus-building guidelines.

Good faith provisions continue to apply to those who withdraw or may be asked to step down.

Press. FISH Group members recognize that the way in which positions are publicly stated may affect the ability of the FISH Group to reach consensus. Therefore, whenever possible, they will refer inquiries from the press regarding the overall progress of the process to the project manager (Susan Davidson) or the facilitator (Marci DuPraw). They agree not to characterize the positions and views of any other party in public forums or press contacts, and *not* to attribute comments to other members.

**DEVELOPMENT OF A FISHERIES AND AQUATIC HABITAT
MANAGEMENT PLAN FOR THE LOWER AMERICAN RIVER
Draft Convening Report
(2/14/00)**

-- EXECUTIVE SUMMARY --

Background. On March 1, 2000, the Lower American River Task Force's Fisheries/In-Stream Habitat (FISH) Work Group will meet for the first time to begin development of a fisheries and aquatic habitat management and restoration plan for the Lower American River (LAR) and baseline "state-of-the-river" report. The Task Force anticipates that, once the Work Group develops its fisheries and aquatic habitat management and restoration plan, the plan will be endorsed by all Work Group members on behalf of their organizations. It will then be submitted to the LAR Task Force for endorsement and incorporation into the River Corridor Management Plan.

This plan will also serve as the Habitat Management Plan for the Lower American River as required by the Water Forum Agreement, consistent with the mitigation described in the Water Forum Agreement Environmental Impact Report. In addition, the Task Force anticipates that this plan will be submitted to additional relevant entities for their use in reviewing, modifying if necessary, and approving the components of the plan for which they are responsible. The actions and individual projects contemplated by the plan will be subject to further review and final approval by the responsible entities.

This report summarizes the input of over 45 diverse stakeholders with respect to the best way to structure the consensus-building effort that will result in this fisheries and aquatic habitat management and restoration plan. This input was gathered in interviews conducted by Senior Mediator Marcelle E. DuPraw of the California Center for Public Dispute Resolution. (See Attachment 1 for a list of interviewees and Attachment 2 for the list of interview questions.) This executive summary provides an overview of the findings from those interviews.

Vision. Interviewees enthusiastically affirmed the need for a venue in which the multiple parties working on restoration-related initiatives in the LAR can coordinate and leverage their efforts to generate concrete benefits for LAR fish. Interviewees emphasized the need for an ecological focus for this Work Group, while taking into consideration flood control and recreation interests. Interviewees articulated the collective vision that the plan that the Work Group develops should protect, restore, and enhance the fisheries and aquatic habitat of the LAR. (See Section III.A., "Hopes and Concerns About This Work Group," and Section III.B., "Definition of 'Success'" for further discussion.)

Issues to Address. Interviewees identified a number of specific issues that Work Group participants would need to address in order to put together this plan. These include: (1) the need to clarify legal requirements; (2) fish-focused issues; (3) ecosystem issues; (4) hatchery policies; (5) gravel management; (6) riverbank condition; (7) water

quality; (8) water temperature; (9) flow-related issues; (10) issues related to man-made structures and interventions in the river corridor; (11) recreation issues; (12) measurement issues; and (13) funding issues. (See Section III.C. for lists of the specific issues under each of these categories.) Interviewees also suggested a number of specific types and sources of data and documents that are likely to be relevant to Work Group deliberations. These can be found in Attachment 3.

Work Group Participants. Interviewees suggested over-all guidelines concerning Work Group participation and outreach (see Section III.D.). In addition, they collectively identified over 80 potential stakeholder groups as candidates for participation (listed in Attachment 4). These candidates come from a wide range of sectors, including resource and flood control agencies, environmental and recreational interest groups, water supply and other local agencies, and technical experts.

Interviewees also identified numerous related initiatives of which they felt the Work Group should be aware in order to facilitate coordination across initiatives where relevant. These initiatives fall into three categories – (1) flood control and water diversion initiatives; (2) resource management initiatives; and (3) recreation initiatives. They are listed in Section III.E, “Linkages.”

Challenges and Keys to Success. While interviewees were enthusiastic about the need for this planning effort, many also indicated that they are spread thin and have significant time constraints on their ability to participate. They readily identified a number of challenges that will have to be overcome for this effort to be successful, including: (1) time constraints; (2) a history of fragmentation; (3) the very dynamic policy context; (4) reconciling competing interests; (5) maintaining momentum; (6) measuring effectiveness; (7) securing follow-through on implementation and funding aspects of the plan; and (8) physical/environmental challenges such as the presence of Folsom and Nimbus Dams. For this reason, many interviewees underscored the need for strong facilitation and technical support. They offered a wealth of suggestions for the way in which this support might best be provided. (For further details, see Section III.F., “Anticipated Challenges in Realizing Success,” and Section III.G., “Keys to Success.”)

Planning Approach. Interviewees articulated a desire for tangible results as quickly as possible. To this end, they generated the idea of a two-track planning process. The primary “track” of the planning process would focus on development of the fisheries and aquatic habitat management and restoration plan. Interviewees urged that the plan should center around a slate of agreed-upon, prioritized restoration projects, building upon clearly-defined goals, a literature review, sound science, and work others have already done in this area. They recommended including strong monitoring, evaluation, and research components, as well as an adaptive management component through which the plan can be strengthened over time to reflect increasing understanding of the LAR ecosystem. The second “track” would provide procedures for early implementation of certain projects for which there may be overwhelming support. Interviewees offered examples of projects they thought might qualify for “early implementation” status. (See Section III.G.3., “Procedural Advice,” for further details.)

Conclusion. The stakeholder input embodied by this document will serve as a key source of guidance for the facilitator and technical consultant to the Work Group as they strive to provide the most constructive possible venue for the Work Group's deliberations. The facilitator's recommended ~~structure~~ and ground rules for the Work Group's planning efforts will be based largely on the findings in this document.

LOWER AMERICAN RIVER
FISHERIES AND AQUATIC HABITAT MANAGEMENT AND RESTORATION PLAN
-- DESIRED OUTCOMES AND GOALS --

Introduction:

This document consists of a list of desired outcomes and related goals for the Fisheries and In-Stream Habitat Group (FISH Group). They are intended to operationalize the FISH Group's vision: "To protect, enhance and restore the fisheries and aquatic and riparian habitat values of the Lower American River ecosystem." All the desired outcomes and goals contained herein can be thought of as contributing to the "super goal" assigned by the FISH Group's parent body, the Lower American River Task Force: "To improve and increase aquatic and terrestrial habitats and improve ecological functions in a manner that will contribute to the health of targeted species found in the LAR." Several documents were referenced in the development of the *Desired Outcomes and Related Goals for Species of Primary Management Concern* (Table 1). The primary documents relied upon were:

- 9 Convening Report for the FISH Group (2000);
- 9 CALFED Ecosystem Restoration Program Plan (1999);
- U.S. Fish and Wildlife Service Anadromous Fish Restoration Program Working Paper on Restoration Needs (1995);
- 9 U.S. Fish and Wildlife Service Draft Restoration Plan for the Anadromous Fish Restoration Program (1997);
- 9 California Department of Fish and Game Steelhead Restoration and Management Plan for California (1996);
- 9 Sacramento Area Flood Control Agency Floodway Management Plan for the Lower American River (1998);
- California Department of Fish and Game Restoring Central Valley Streams: A Plan for Action (1993); and
- 9 Habitat Management Element of the Water Forum Agreement (2000).

The goals and objectives herein are consistent with those contained in the above documents.

Scope:

The Lower American River (LAR) is a multipurpose system providing flood control, recreation, water supply, hydropower generation, fishery, wildlife and aesthetic uses. The goals presented herein focus on enhancing and restoring LAR fisheries **and** aquatic and riparian habitat values. Although there are at least **43** fish species found in the LAR and each fulfills an ecological role, species of primary *management* concern include fall-run chinook salmon, steelhead, splittail, other native resident fish (e.g., hardhead, tule perch, Sacramento sucker, and Pacific lamprey), and the non-native American shad and striped bass.

- ▪ Applicable laws -- in particular, the Endangered Species Act (ESA) -- in essence mandate a management focus on anadromous salmonids (fall-run chinook salmon and steelhead) and splittail and, consequently, management for a coldwater fishery.’ Compliance with state and federal ESA listings and other mandates, availability of American River-specific data, and the particular habitat requirements of anadromous salmonids all support development of an initial plan based primarily on the needs of the river’s anadromous salmonid resources, as well as splittail. The needs of these species constitute the top priority of this FISH Plan.

However, improving conditions for American River anadromous salmonids and splittail also will generally provide suitable conditions for non-natal salmonids rearing in the **LAR**, for other native resident aquatic and terrestrial species, and for the non-native American shad and striped bass, which are of recreational importance. The FISH Plan also includes goals that meet the needs of these species.

A monitoring regimen addressing a wider range of biota will be used to consider improvements to the initial plan. The monitoring regimen associated with the initial plan is expected to focus on fish and organisms directly related to fish: It is anticipated that subsequent iterations of the monitoring regimen could include additional species of concern, such as those for which a recovery plan is in place.

Although ecosystem attributes are included among the objectives under these goals, ecosystem structure, functions, and processes will be addressed within the context of the regulated **LAR** system. Valuable biotic and abiotic interactions also will be protected through efforts to enhance **LAR** conditions for the species of primary management concern. Habitat restoration, in this context, is an effort to improve the health of **LAR** fisheries and aquatic and riparian habitat, while recognizing fundamental constraints currently present in the system. Improvements to the **LAR** ecosystem will accommodate regulatory requirements, with special emphasis on the recovery objectives of the Endangered Species Act.

The restoration and management efforts encompassed by the FISH Plan will take place within the boundaries of the **LAR** corridor (and generally within the American River Parkway). However, out-of-boundary habitat influences may also be considered by the FISH Group in formulating the goals, objectives, and actions necessary to implement the FISH Plan where they directly affect **LAR** fisheries and/or aquatic or riparian habitat.

▪ Splittail and steelhead are listed as “threatened” under the federal Endangered Species Act and as a “species of concern” under the California Endangered Species Act. Fall-run chinook salmon is a candidate for listing under the federal Endangered Species Act.

TABLE 1
DESIRED OUTCOMES AND RELATED GOALS
FOR SPECIES OF PRIMARY MANAGEMENT CONCERN

Desired Outcome	Goal
Increase and maintain viable populations of naturally spawning fall-run chinook salmon and steelhead. ^{2,3,4}	Provide appropriate spawning/incubation habitat quality and quantity
	Provide appropriate rearing habitat quality and quantity
	Provide appropriate juvenile outmigration conditions
	Provide appropriate adult upstream migration conditions
	Ensure that in-stream harvest is consistent with maintaining viable in-stream spawning populations
	Maintain proper balance between hatchery operations and in-stream spawning populations
	Reduce adverse effects of water diversion intakes

² This outcome is expected to contribute to a sustainable ocean fishery for salmon.

³ See glossary for definition of the phrase, "viable populations of naturally spawning fall-run chinook salmon and steelhead."

⁴ The focus of the initial FISH Plan is on the Lower American River, and the FISH Group recognizes that there are a number of external variables affecting the wellbeing of these populations. If monitoring results indicate that these exigent variables are overwhelming obstacles to achieving this goal, the FISH Group may re-assess its scope and goals.

TABLE 1
DESIRED OUTCOMES AND RELATED GOALS
FOR SPECIES OF PRIMARY MANAGEMENT CONCERN

Achieve and maintain a viable population of splittail	Provide appropriate spawning and rearing habitat quality and quantity Reduce adverse effects of water diversion intakes
Restore or maintain an appropriate distribution and abundance of resident native fish species such as hardhead, tule perch, Sacramento sucker, and Pacific lamprey.	Provide appropriate spawning and rearing habitat quality and quantity for resident native fish. Provide appropriate spawning (American shad) and rearing (striped bass) habitat quality and quantity
Maintain American shad and striped bass populations of sufficient abundance to sustain fisheries, consistent with restoring native species.	Reduce adverse effects of water diversion intakes

'' GLOSSARY OF KEY WORDS AND PHRASES

'' “Increase and maintain viable populations **of** naturally spawning fall-run chinook salmon and steelhead”: The overall goals for anadromous salmonids in the LAR, defined as “increase and maintain viable populations of naturally spawning, fall-run chinook salmon and steelhead,” can be further characterized by the following population attributes:

- 9 sufficiently diverse, abundant, and productive to survive environmental variations, such as fluctuations in ocean conditions or local disturbances;
- sufficiently diverse and abundant to provide resilience to disease as well as to environmental and human disturbances;
- sufficiently diverse and abundant to maintain long-term genetic diversity;
- natural productivity sufficient to maintain population abundance above the sustainable level;
- exhibiting a trend of proportionally stable or decreasing contributions from naturally spawning fish of hatchery origin;
- absence of sustained declines in abundance that span multiple generations and affect multiple broodyear-cycles;
- no indications of imminent productivity declines; and
- maintenance of traits indicating population is robust with regard to run timing, age structure, size, fecundity, morphology, behavior, and molecular genetic characteristics.

“In-Stream” means within the Lower American River.

“Naturally spawning” means fish spawning in the river rather than in the hatchery.

The phrase, “The **LAR is a** multipurpose system” (p. 1), refers to the river itself, its associated riparian vegetation, the floodplain, and the levees.

“Geomorphic processes” refers to those dynamics that shape the landscape (e.g., the rate and volume of run-off and the erosion, transport, and deposition of sediment by water).

**LOWER AMERICAN RIVER FISHERIES AND INSTREAM HABITAT
WORKING GROUP (FISH WORK GROUP)**

**INITIAL FISHERIES AND AQUATIC HABITAT
MANAGEMENT AND RESTORATION PLAN**

DRAFT OUTLINE

1.0 INTRODUCTION

1.1 BACKGROUND

- 1.1.1 FISH Working Group
 - 1.1.1.1 Bibliography
 - 1.1.1.2 Baseline Report
 - 1.1.1.3 Fisheries and Aquatic Habitat Management and Restoration Plan
- 1.1.2 Water Forum Agreement and EIR/Habitat Management Element
- 1.1.3 LAR Task Force
 - 1.1.1.4 Floodway Management Plan
 - 1.1.1.5 River Corridor Management Plan
- 1.1.4 American River Parkway Plan
- 1.1.5 CALFED Ecosystem Restoration Program Plan
- 1.1.6 Central Valley Project Improvement Act Anadromous Fish Restoration Program
- 1.1.7 California Department of Fish and Game Steelhead Restoration and Management Plan for California
- 1.1.8 California Department of Fish and Game Restoring Central Valley Streams: A Plan for Action
- 1.1.9 Other Lower American River Plans

1.2 PURPOSE AND INTENDED USES OF THE PLAN

- 1.2.1 Scope of the Plan
- 1.2.2 Restoration and Rehabilitation
- 1.2.3 Ecosystem Approach in a Regulated System

1.3 PROJECT LOCATION

- 1.3.1 Nimbus Dam to Mouth of American River
- 1.3.2 Corridor and Watershed Boundaries

1.4 RELATED/ONGOING INITIATIVES

- 1.4.1 Lower American River Operations Working Group
- 1.4.2 Lower American River Technical Committee Updated Lower American River Flow Standard
- 1.4.3 Long-Term Reoperation of Folsom Dam and Reservoir
- 1.4.4 California Department of Fish and Game Stream Evaluation Program
- 1.4.5 US Army Corps of Engineers Comprehensive Flood Control Study

2.0 GOALS AND OBJECTIVES

2.1 DECISION PROCESS

- 2.1.1 State and Federal Endangered Species Act Listings and Other Mandates
- 2.1.2 Availability of American River-Specific Data
- 2.1.3 Habitat Requirements of Anadromous Salmonids
- 2.1.4 Focus on Coldwater Species
- 2.1.5 Species of Primary Management Concern
 - 2.1.5.1 Chinook Salmon
 - 2.1.5.2 Steelhead
 - 2.1.5.3 Splittail
 - 2.1.5.4 Other Native Resident Fish
 - 2.1.5.5 American Shad
 - 2.1.5.6 Striped Bass
- 2.1.6 Incidental Benefits
 - 2.1.6.1 Non-natal Salmonids Utilizing the LAR
 - 2.1.6.2 Other Native Resident Aquatic and Riparian Species

2.2 DESIRED OUTCOMES FOR SPECIES OF PRIMARY MANAGEMENT CONCERN

- 2.2.1 Increase and Maintain Viable Populations of Naturally Spawning Fall-run Chinook Salmon and Steelhead
 - 2.2.1.1 Goals
 - 2.2.1.2 Objectives
- 2.2.2 Achieve and Maintain a Viable Population of Splittail
 - 2.2.2.1 Goals
 - 2.2.2.2 Objectives
- 2.2.3 Restore or Maintain an Appropriate Distribution and Abundance of Resident Native Fish Species
 - 2.2.3.1 Goals
 - 2.2.3.2 Objectives
- 2.2.4 Maintain American Shad and Striped Bass Populations of Sufficient Abundance to Sustain Fisheries, Consistent with Restoring Native Species
 - 2.2.4.1 Goals
 - 2.2.4.2 Objectives

3.0 ECOSYSTEM RELATIONSHIPS OF SPECIES OF MANAGEMENT CONCERN

- 3.1 FALL-RUN CHINOOK SALMON AND STEELHEAD HABITAT RELATIONSHIPS**
- 3.2 SPLITTAIL HABITAT RELATIONSHIPS**
- 3.3 OTHER RESIDENT NATIVE FISH HABITAT RELATIONSHIPS**
- 3.4 STRIPED BASS HABITAT RELATIONSHIPS**
- 3.5 AMERICAN SHAD HABITAT RELATIONSHIPS**

4.0 CURRENT STATUS OF LOWER AMERICAN RIVER ECOSYSTEM (SUMMARY OF BASELINE REPORT)

4.1 FISHERIES

- 4.1.1 Fall-run Chinook Salmon Population Size and Trends
- 4.1.2 Steelhead Population Size and Trends
- 4.1.3 Splittail Population Size and Trends
- 4.1.4 Other Native Resident Fish Population *Sizes* and Trends
- 4.1.5 American Shad Population Size and Trends
- 4.1.6 Striped ~~Bass~~ Population Size and Trends

4.2 RIVER FLOWS AND WATER TEMPERATURES

- 4.2.1 River Hydraulics/Geomorphology

4.3 RIPARIAN ATTRIBUTES

4.4 INSTREAM HABITATS

5.0 CONCEPTUAL MODELS OF LAR ECOSYSTEM STRUCTURES, FUNCTIONS, AND PROCESSES

5.1 HABITAT CHARACTERISTICS → STRESSORS → RESTORATION PRIORITIES

5.2 TESTABLE HYPOTHESES

6.0 CONCEPTUAL MODELS OF RESTORATION PROCESSES

6.1 STRESSORS → RESTORATION PROJECTS → DESIRED OUTCOMES

6.2 TESTABLE HYPOTHESES

7.0 MANAGEMENT AND RESTORATION PROJECTS

7.1 SELECTION CRITERIA

7.2 SELECTED IMPLEMENTATION PROJECTS

- 7.2.1 Management Interventions (New or Modifications)
- 7.2.2 Site-specific Restoration Actions
- 7.2.3 Research Projects

8.0 RECOMMENDATIONS FOR DIRECTED RESEARCH

9.0 IMPLEMENTATION PLAN

9.1 PROJECT PRIORITIZATION

9.2 PROJECT SEQUENCING

9.3 TIMELINE FOR RESTORATION AND MANAGEMENT ACTIONS

9.4 LEAD AGENCIES' ROLES AND RESPONSIBILITIES

9.5 TECHNICAL ASSISTANCE NEEDED TO DEVELOP, UPDATE, ADMINISTER AND IMPLEMENT THE PLAN AND MONITOR RESULTS

9.6 COST SHARING AND ADMINISTRATIVE ARRANGEMENTS

9.7 POTENTIAL OBSTACLES TO IMPLEMENTATION AND STRATEGY FOR OVERCOMING THEM

10.0 ECOLOGICAL AND BIOLOGICAL MONITORING PLAN

- 10.1 BIOLOGICAL AND ECOLOGICAL MONITORING OBJECTIVES**
- 10.2 HYPOTHESES TO BE EVALUATED**
- 10.3 PERSONNEL CONDUCTING THE MONITORING AND RELATED EXPERIENCE**
- 10.4 DURATION AND FREQUENCY OF MONITORING**
- 10.5 CONSTITUENTS TO BE MONITORED**
- 10.6 LOCATIONS OF MEASUREMENT**
- 10.7 TYPE OF EQUIPMENT**
- 10.8 DATA COLLECTION, HANDLING, AND STORAGE TECHNIQUES**
- 10.9 ANALYTICAL TECHNIQUES**
- 10.10 DATA SYNTHESIS AND ANALYSIS**
- 10.11 REPORT FREQUENCY, CONTENT AND FORMAT**
- 10.12 DATA COLLECTION AND EVALUATION PROTOCOLS**
- 10.13 INTEGRATION WITH OTHER MONITORING PROGRAMS**

11.0 ADAPTIVE MANAGEMENT

- 11.1 APPROACH AND METHODS FOR DATA EVALUATION**
 - 11.1.1 Results of Monitoring Restoration Actions and Other Internally Generated Information
 - 11.1.2 Externally Generated Information
- 11.2 TRIGGER MECHANISM FOR CONSIDERING REVISIONS TO CONCEPTUAL MODEL**
- 11.3 DEVELOPMENT OF NEW OR ADAPTED RESTORATION ACTIONS**
- 11.4 PROTOCOLS FOR UPDATING PLAN**
- 11.5 ISSUES TO CONSIDER IN FUTURE PLAN REFINEMENTS**

APPENDIX A COMPLETE LIST OF PROJECTS CONSIDERED

- A1. Management Interventions (New or Modifications)
- A2. Site-specific Restoration Actions
- A3. Research Projects

**LOWER AMERICAN RIVER FISHERIES AND INSTREAM HABITAT
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- 1.2.1 Scope of the Plan**
- 1.2.2 Restoration and Rehabilitation**
- 1.2.3 Ecosystem Approach in a Regulated System**

1.3 PROJECT LOCATION

- 1.3.1 Nimbus Dam to Mouth of American River**
- 1.3.2 Corridor and Watershed Boundaries**

1.4 RELATED/ONGOING INITIATIVES

- 1.4.1 Lower American River Operations Working Group**
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- 1.4.3 Long-Term Reoperation of Folsom Dam and Reservoir**
- 1.4.4 California Department of Fish and Game Stream Evaluation Program**
- 1.4.5 US Army Corps of Engineers Comprehensive Flood Control Study**

2.0 GOALS AND OBJECTIVES

2.1 DECISION PROCESS

- 2.1.1 State and Federal Endangered Species Act Listings and Other Mandates
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 - 2.1.5.6 Striped Bass
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 - 2.2.3.2 Objectives
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4.3 RIPARIAN ATTRIBUTES

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9.2 PROJECT SEQUENCING

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- 10.8 DATA COLLECTION, HANDLING, AND STORAGE TECHNIQUES**
- 10.9 ANALYTICAL TECHNIQUES**
- 10.10 DATA SYNTHESIS AND ANALYSIS**
- 10.11 REPORT FREQUENCY, CONTENT AND FORMAT**
- 10.12 DATA COLLECTION AND EVALUATION PROTOCOLS**
- 10.13 INTEGRATION WITH OTHER MONITORING PROGRAMS**

11.0 ADAPTIVE MANAGEMENT

- 11.1 APPROACH AND METHODS FOR DATA EVALUATION**
 - 11.1.1 Results of Monitoring Restoration Actions and Other Internally Generated Information
 - 11.1.2 Externally Generated Information
- 11.2 TRIGGER MECHANISM FOR CONSIDERING REVISIONS TO CONCEPTUAL MODEL**
- 11.3 DEVELOPMENT OF NEW OR ADAPTED RESTORATION ACTIONS**
- 11.4 PROTOCOLS FOR UPDATING PLAN**
- 11.5 ISSUES TO CONSIDER IN FUTURE PLAN REFINEMENTS**

APPENDIX A COMPLETE LIST OF PROJECTS CONSIDERED

- A1. Management Interventions (New or Modifications)
- A2. Site-specific Restoration Actions
- A3. Research Projects

DRAFT RCMP OUTLINE

FOREWORD

ATTACHMENT M

I. INTRODUCTION

A. Context

1. Need for this document -- brief description of the LAR ecosystem & synopsis of past LAR management efforts; should briefly indicate why document is organized around the 3 selected management elements
2. Relationship of this document to FMP, Parkway Plan, CALFED's ERPP, CVPIA/AFRP, CDFG's Restoring Central Valley Streams: A Plan for Action, & other key planning documents

B. RCMP Goals -- from RCMP Statement of Support, refined to reflect Work Group's efforts and insights gained while carrying out their respective charges

II. APPROACH

A. Narrative description of the way in which local, state, and federal agencies, other technical experts, and stakeholder groups worked together to develop the RCMP (LAR Task Force, Water Forum, Work Groups, other forms of outreach and coordination)

B. Diagram of II.A.

III. OVER-ARCHING PRINCIPLES (e.g., drawn from FMP, Parkway Plan, Water Forum Agreement, CALFED's ERPP, CVPIA/AFRP, CDFG's Restoring Central Valley Streams: A Plan for Action, and other agency documents -- integrated and tailored to the unique characteristics of the LAR)

IV. KEY GOALS, OBJECTIVES, AND ACTIONS BY ELEMENT & PROGRAM

A. Aquatic Habitat Management

1. Need/purpose for including this element (e.g., what was wrong with things as they were)
2. Programmatic goals and objectives (likely to include additional layers, such as sub-goals and sub-objectives; work groups will coordinate *this*)

- 3. Proposed actions/projects/changes in management practices (prioritized, with anticipated lead agency and funding sources identified)
- 4. Data gaps and research needs

B. Floodway Management (introduction explaining rationale for breaking this element down into 3 programs and discussing any cross-cutting themes or supra-goals)

1. Vegetation Resource Management Program

- a. Need/purpose for including this element (e.g., what was wrong with things as they were)
- b. Programmatic goals and objectives (likely to include additional layers, such as sub-goals and sub-objectives; work groups will coordinate this)
- c. Proposed actions/projects/changes in management practices (prioritized, with anticipated lead agency and funding sources identified)
- d. Data gaps and research needs

2. Anticipatory Erosion Control Program

- a. Need/purpose for including this element (e.g., what was wrong with things as they were)
- b. Programmatic goals and objectives (likely to include additional layers, such as sub-goals and sub-objectives; work groups will coordinate this)
- c. Proposed actions/projects/changes in management practices (prioritized, with anticipated lead agency and funding sources identified)
- d. Data gaps and research needs

3. Facilities Redesign/Relocation Program

- a. Need/purpose for including this element (e.g., what was wrong with things as they were)
- b. Programmatic goals and objectives (likely to include additional layers, such as sub-goals and sub-objectives; work groups will coordinate this)
- c. Proposed actions/projects/changes in management practices (prioritized, with anticipated lead agency and funding sources identified)
- d. Data gaps and research needs

C. Recreation Management

1. Need/purpose for including this element (e.g., what was wrong with things as **they** were)
2. Programmatic goals and objectives (likely to include additional layers, such **as** sub-goals and sub-objectives; work groups will coordinate this)
3. Proposed actions/projects/changes in management practices (prioritized, with anticipated lead agency and funding sources identified)
4. Data gaps and research needs

V. RIVER CORRIDOR ACTION PLAN MATRIX

VI. ECOLOGICAL AND BIOLOGICAL MONITORING AND EVALUATION STRATEGY

VII. ADAPTIVE MANAGEMENT STRATEGY

LOWER AMERICAN RIVER
FISHERIES AND INSTREAM HABITAT (FISH) GROUP

BASELINE REPORT: DRAFT OUTLINE
(6 levels of detail)

PREFACE

- 1.0 INTRODUCTION**
- 1.1 BACKGROUND**
 - 1.1.1 Related/Ongoing Initiatives
 - 1.1.1.1 CALFED ERP
 - 1.1.1.2 CVPIAAFRP
 - 1.1.1.3 Water Forum - Habitat Management Element
 - 1.1.1.4 EDF v. EBMUD
- 1.2 PURPOSE AND INTENDED USES OF THE REPORT**
 - 1.2.1 Scope of the Report
 - 1.2.2 Restoration/Rehabilitation
 - 1.2.3 Ecosystem Based Approach – Indicator Species
 - 1.2.4 Linkage Between Various Fish Life Stages and Ecosystem Attributes
 - 1.2.5 Corridor/Watershed Boundaries
 - 1.2.6 Historical Descriptions of Trends and Stressors as Context for Plan
 - 1.2.7 Current and Anticipated Future Stressors and Limiting Factors
- 1.3 PROJECT LOCATION**
 - 1.3.1 Nimbus Dam to Mouth of American River
 - 1.3.2 Influence of Folsom Dam Operations
- 1.4 CONTEXT WITHIN MULTI-PURPOSE INTEGRATED PLAN**
 - 1.4.1 River Corridor Management Plan
 - 1.4.2 Fisheries and Aquatic Habitat Management and Restoration Plan
 - 1.4.3 Floodway Management Plan/Bank Protection Plan
 - 1.4.4 Other Lower American River Plans
- 2.0 HISTORICAL TRENDS OF THE LOWER AMERICAN RIVER**
- 2.1 FISHERIES**
 - 2.1.1 Historical Population Trends
 - 2.1.1.1 Pre-Folsom Dam Period (pre 1955)
 - 2.1.1.2 Early Post-Folsom Dam Period
 - 2.1.2 Species Present in the Lower American River
 - 2.1.3 Primary Species of Management Concern
- 2.2 RNER FLOWS AND WATER TEMPERATURES**
 - 2.2.1 Unimpaired Flow Regime
 - 2.2.1.1 Annual Hydrograph
 - 2.2.1.2 Annual Water Yield
 - 2.2.1.3 Hydrograph Components
 - 2.2.1.4 Flow-duration Curves

- 2.2.2 Unimpaired Water Temperature Regime
- 2.2.3 Regulatory Standards
 - 2.2.3.1 SWRCB Decisions
 - s 0893
 - D1400
 - "Modified" D1400
 - 2.2.3.2 EDF v. EBMUD
 - 2.2.3.3 Recent Changes (AFRP)
- 2.2.4 USBR Operational Controls
 - 2.2.4.1 Flood Control Diagram
 - 2.2.4.2 Gates/Operations
 - 2.2.4.3 Power Penstock Capabilities
 - 2.2.4.4 Shutters
 - 2.2.4.5 Folsom Dam TCD
 - 2.2.4.6 El Dorado Irrigation District TCD
 - 2.2.4.7 Optimal Coldwater Pool Management
- 2.2.5 Regulated Flow Regime
 - 2.2.5.1 Hydrograph
 - 2.2.5.2 Water Yield
 - 2.2.5.3 Hydrograph Components
 - 2.2.5.4 Flow Fluctuations
- 2.2.6 Regulated Water Temperature Regime
- 2.3 RIVER HYDRAULICS/GEOMORPHOLOGY**
 - 2.3.1 Historical Trends
 - 2.3.1.1 Hydraulic Gold Mining in Sierras
 - 2.3.1.2 Dredging of Channels and Adjacent Terraces
 - 2.3.1.3 Tree Cutting and Agricultural Development
 - 2.3.1.4 Old Folsom Dam Construction
 - 2.3.1.5 Folsom Dam/Nimbus Dam Construction
 - 2.3.1.6 Flood Control Levees
 - 2.3.1.7 Down-cutting of River Channel
 - 2.3.1.8 Lateral Erosion of Banks
 - 2.3.2 Historical Channel Morphology
 - 2.3.3 Historical Sediment Supply
 - 2.3.4 Historical Sediment Transport
- 2.4 RIPARIAN ATTRIBUTES**
 - 2.4.1 Shaded Riverine Aquatic Cover
 - 2.4.2 Backwater Ponds, Marshes, and Wetland Sloughs
 - 2.4.3 Nearshore Terraces
 - 2.4.4 Mid-channel Islands and Side Channels
- 2.5 INSTREAM HABITATS**
 - 2.5.1 Reaches
 - 2.5.1.1 Reach 1 – Confluence to Paradise Beach Recreation Area
 - 2.5.1.2 Reach 2 – Paradise Beach Recreation Area to Gristmill Dam Recreation Area
 - 2.5.1.3 Reach 3 – Gristmill Dam Recreation Area to Nimbus Dam
 - 2.5.2 Major Channel Features
 - 2.5.2.1 Bar Complex
 - 2.5.2.2 Flatwater
 - 2.5.2.3 Off-channel

- 2.5.3 Channel Feature Types
 - 2.5.3.1 Island Complex
 - 2.5.3.2 Mid-channel bar
 - 2.5.3.3 Lateral Bar
 - 2.5.3.4 Channel-spanning Bar
 - 2.5.3.5 Transverse Bar
 - 2.5.3.6 Channel Bend
 - 2.5.3.7 Straight Channel
 - 2.5.3.8 Split Channel
 - 2.5.3.9 Off-channel Area Contiguous with Main Channel
 - 2.5.3.10 Off-channel Area Not Contiguous with Main Channel
- 2.5.4 Habitat Units
 - 2.5.4.1 **Riffle**
 - 2.5.4.2 Run
 - 2.5.4.3 Glide
 - 2.5.4.4 Pool
- 2.5.5 Flora and Fauna
 - 2.5.5.1 Species Associated with Major Channel Features
 - 2.5.5.2 Species Associated with Other Channel Feature Types
 - 2.5.5.3 Species Associated with Defined Instream Habitat Units

3.0 CURRENT STATUS

3.1 FISHERIES

- 3.1.1 Fall-Run Chinook Salmon
 - 3.1.1.1 Population Status
 - ***Annual Spawning Stock Escapement Estimation***
 - ***Recent Trends***
 - 3.1.1.2 Adult Upstream Migration
 - ***Temporal Distribution***
 - ✓ Flow/Temperature Relationships
 - 3.1.1.3 Spawning
 - ***Temporal Distribution***
 - ✓ Flow/Temperature Relationships
 - ***Spatial Distribution***
 - ✓ Flow/Habitat Relationships
 - ✓ Spawning Habitat Availability (IFIM Studies)
 - ✓ Redd Superimposition
 - ✓ Surface Substrate Composition
 - ✓ Intergravel Permeability
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - ***Overall Species Status by Life Stage***
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements

- 3.1.1.4 Incubation
 - **Temporal Distribution**
 - ✓ Flowffemperature Relationships
 - e **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - e **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.1.5 Fry Rearing
 - a **Temporal Distribution**
 - ✓ Flowffemperature Relationships
 - e **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Rearing Habitat Availability (IFIM Studies)
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Vvariations
 - e **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.1.6 Juvenile Outmigration
 - e **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - a **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Vvariations
 - a **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.2 Steelhead
 - 3.1.2.1 Population Status
 - e **Existing information**
 - e **Recent Trends**
 - 3.1.2.2 Adult Upstream Migration
 - e **Temporal Distribution**
 - ✓ Flowffemperature Relationships
 - 3.1.2.3 Spawning
 - e **Temporal Distribution**
 - ✓ Flowffemperature Relationships

- a ***Spatial Distribution***
 - ✓ Flowmabitat Relationships
 - ✓ Spawning Habitat Availability (IFIM Studies)
 - ✓ Redd Superimposition
 - ✓ Surface Substrate Composition
 - ✓ Intergravel Permeability
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - a ***Overall Species Status by Life Stage***
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.2.4 Incubation
 - a ***Temporal Distribution***
 - ✓ Flow/Temperature Relationships
 - a ***Spatial Disiribution***
 - ✓ Flowmabitat Relationships
 - e ***Overall Species Status by Life Stage***
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.2.5 Fry Rearing
 - a ***Temporal Distribution***
 - ✓ Flow/Temperature Relationships
 - a ***Spatial Distribution***
 - ✓ Flowmabitat Relationships
 - ✓ Rearing Habitat Availability (IFIM Studies)
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Vvariations
 - a ***Overall Species Status by Life Stage***
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.2.6 Juvenile Outmigration
 - a ***Temporal Distribution***
 - ✓ Flow/Temperature Relationships
 - a ***Spatial Distribution***
 - ✓ Flow/Habitat Relationships
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Vvariations
 - e ***Overall Species Status by Life Stage***
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.3 Splittail
 - 3.1.3.1 Population Status
 - a ***Existing Information***
 - e ***Recent Trends***

- 3.1.3.2 Spawning and Incubation
 - **Temporal Distribution**
 - **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Spawning Habitat – Inundated Riparian Vegetation
 - ✓ Flow fluctuations – Stranding and Dewatering
 - ✓ Flow/Temperature Relationships
 - **Overall Species Status**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.4 American Shad
 - 3.1.4.1 Population Status
 - a **Existing information**
 - a **Recent Trends**
 - 3.1.4.2 Spawning
 - **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Spawning Habitat Availability (IFIM Studies)
 - ✓ Redd Superimposition
 - ✓ Surface Substrate Composition
 - ✓ Intergravel Permeability
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
 - 3.1.4.3 Incubation
 - **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - a **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
 - 3.1.4.4 Fry Rearing
 - **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - a **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ **Rearing** Habitat Availability (IFIM Studies)
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - **Overall Species Status by Life Stage**
 - ✓ Limitations of Data

- ✓ Recommended Data Improvements
- 3.1.4.5 Juvenile Rearing to Adult
 - s **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - a **Spaiial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - s **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.5 Striped Bass
 - 3.1.5.1 Population Status
 - **Existing Information**
 - **Recent Trends**
 - 3.1.5.2 Spawning
 - s **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - **Spatial Distribution**
 - ✓ Flowmabitat Relationships
 - ✓ Spawning Habitat Availability (IFIM Studies)
 - ✓ Redd Superimposition
 - ✓ Surface Substrate Composition
 - ✓ Intergravel Permeability
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - s **Overall Species status by Life Stage**
 - ✓ Limitations of ~~Data~~
 - ✓ Recommended Data Improvements
 - 3.1.5.3 Incubation
 - **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - a **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
 - 3.1.5.4 Fry Rearing
 - s **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - **Spatial Distribution**
 - ✓ Flowmabitat Relationships
 - ✓ Rearing Habitat Availability (IFIM Studies)
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - a **Overall Species Status by Life Stage**

- ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.5.5 Juvenile Rearing to Adult
 - **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - e **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
- 3.1.6 Resident Native Fish Species
 - 3.1.6.1 Population Status
 - **Existing information**
 - **Recent Trends**
 - 3.1.6.2 Spawning
 - **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - e **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Spawning Habitat Availability (IFIM Studies)
 - ✓ Redd Superimposition
 - ✓ Surface Substrate Composition
 - ✓ Intergravel Permeability
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - e **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
 - 3.1.6.3 Incubation
 - e **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - e **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
 - 3.1.6.4 Fry Rearing
 - e **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - e **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Rearing Habitat Availability (IFIM Studies)
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations

- a **Overall Species Status by Life Stage**
 - ✓ Limitations of **Data**
 - ✓ Recommended Data Improvements
 - 3.1.6.5 Juvenile Rearing to Adult
 - a **Temporal Distribution**
 - ✓ Flow/Temperature Relationships
 - a **Spatial Distribution**
 - ✓ Flow/Habitat Relationships
 - ✓ Water Temperature
 - ✓ Temperature Considerations
 - ✓ Longitudinal Temperature Variations
 - **Overall Species Status by Life Stage**
 - ✓ Limitations of Data
 - ✓ Recommended Data Improvements
 - 3.1.7 Out-of-Basin Factors Affecting Fisheries
 - 3.1.7.1 Ocean Harvest Rates
 - 3.1.7.2 Delta Factors (Water Quality)
 - 3.1.7.3 Ocean /Climactic Conditions
- 3.2 **HYDROLOGY: RIVER FLOWS AND WATER TEMPERATURES**
 - 3.2.1 **Annual** Hydrology
 - 3.2.1.1 Hydrograph
 - **Average Annual Water Yield**
 - **Water Year Type Classifications**
 - 3.2.2 Seasonal Hydrology
 - 3.2.2.1 Minimum Flows
 - 3.2.2.2 Flood Flows
 - 3.2.2.3 Flushing/Pulse Flows
 - 3.2.2.4 Flow Fluctuations
 - 3.2.3 Water Temperatures
 - 3.2.3.1 Seasonal Temperature Regimes
 - **Fall**
 - a **Winter**
 - a **spring**
 - **Summer**
- 3.3 **RIVER HYDRAULICS AND RELATED FLUVIAL GEOMORPHOLOGY**
 - 3.3.1 Flow Mechanics
 - 3.3.1.1 Flow Velocity
 - 3.3.1.2 Flow Depths
 - 3.3.2 Morphological Processes and Forms
 - 3.3.2.1 Depositional
 - **Channel Bars**
 - **Infilling**
 - **Migration and Growth of Shoals**
 - a **Point Bar Formation**
 - 3.3.2.2 Sediment Composition
 - a **Grain size**
 - **Sorting**
 - 3.3.2.3 Erosional
 - a **Bed Scour**

- a *Bedload Transport*
 - *Bank Erosion*
 - *Meander Development and Propagation*
 - e *Scour Holes*
 - 3.3.3 Riffle-Pool Sequences
 - 3.3.4 Channel Gradient and the Longitudinal Profile
- 3.4 **RIPARIAN ATTRIBUTES**
 - 3.4.1 Shaded Riverine Aquatic Cover
 - 3.4.1.1 Species Listings
 - 3.4.1.2 Spatial Distribution and Density
 - 3.4.2 Backwater Ponds, Marshes, and Wetland Sloughs
 - 3.4.2.1 Species listings
 - 3.4.2.2 Spatial Distribution and Density
 - 3.4.3 Nearshore Terraces
 - 3.4.3.1 Species Listings
 - 3.4.3.2 Spatial Distribution and Density
 - 3.4.4 Mid-channel Islands and Side Channels
 - 3.4.4.1 Species Listings
 - 3.4.4.2 Spatial Distribution and Density
- 3.5 **INSTREAM HABITATS**
 - 3.5.1 Reach 1
 - 3.5.1.1 Major Channel Features
 - a *Flora and Fauna*
 - e *Limiting Factors*
 - 3.5.1.2 Channel Feature Types
 - e *Flora and Fauna*
 - a *Limiting Factors*
 - 3.5.1.3 Habitat Units
 - a *Flora and Fauna*
 - *Limiting Factors*
 - 3.5.2 Reach 2
 - 3.5.2.1 Major Channel Features
 - e *Flora and Fauna*
 - e *Limiting Factors*
 - 3.5.2.2 Channel Feature Types
 - a *Flora and Fauna*
 - a *Limiting Factors*
 - 3.5.2.3 Habitat Units
 - e *Flora and Fauna*
 - e *Limiting Factors*
 - 3.5.3 Reach 3
 - 3.5.3.1 Major Channel Features
 - e *Flora and Fauna*
 - a *Limiting Factors*
 - 3.5.3.2 Channel Feature Types
 - *Flora and Fauna*
 - e *Limiting Factors*
 - 3.5.3.3 Habitat Units
 - a *Flora and Fauna*

- *Limiting Factors*

- 4.0 SUMMARY OF FINDINGS AND LIMITATIONS**
- 4.1 FISHERIES**
- 4.2 RIVER HYDRAULICS/GEOMORPHOLOGY**
- 4.3 RIVER FLOWS AND WATER TEMPERATURES**
- 4.4 RIPARIAN ATTRIBUTES**
- 4.5 INSTREAM HABITATS**
- 5.0 RECOMMENDATIONS FOR DIRECTED RESEARCH**
- 6.0 LITERATURE CITED**

APPENDICES